TOSHIBA

FILE NO. A03-009

SERVICE MANUAL

SUPER

SUPER MODULAR MULTI

HFC

R410A

Indoor Unit

<4-way Air Discharge Cassette Type>

MMU-AP0091H, AP0121H, AP0151H,
MMU-AP0181H, AP0241H, AP0271H,
MMU-AP0301H, AP0361H, AP0481H
MMU-AP0561H

<2-way Air Discharge Cassette Type>

MMU-AP0071WH, AP0091WH, AP0121WH,
MMU-AP0151WH, AP0181WH, AP0241WH,
MMU-AP0271WH, AP0301WH
MMU-AP0481WH (CHINA market only)

<1-way Air Discharge Cassette Type>

MMU-AP0071YH, AP0091YH, AP0121YH,
MMU-AP0151SH, AP0181SH, AP0241SH

<Concealed Duct Standard Type>

MMD-AP0071BH, AP0091BH, AP0121BH,
MMD-AP0151BH, AP0181BH, AP0241BH,
MMD-AP0271BH, AP0301BH, AP0361BH,
MMD-AP0481BH, AP0561BH

<Concealed Duct High Static Pressure Type>

MMD-AP0181H, AP0241H, AP0271H,
MMD-AP0361H, AP0481H, AP0721H,
MMD-AP0961H

<Under Ceiling Type>

MMC-AP0151H, AP0181H, AP0241H,
MMC-AP0271H, AP0361H, AP0481H

<High Wall Type>

MMK-AP0071H, AP0091H, AP0121H,
MMK-AP0151H, AP0181H, AP0241H

<Floor Standing Cabinet Type>

MML-AP0071H, AP0091H, AP0121H,
MML-AP0151H, AP0181H, AP0241H

<Floor Standing Concealed Type>

MML-AP0071BH, AP0091BH, AP0121BH,
MML-AP0151BH, AP0181BH, AP0241BH

<Floor Standing Type>

MMF-AP0151H, AP0181H, AP0241H
MMF-AP0271H, AP0361H, AP0481H
MMF-AP0561H

Outdoor Unit

Cooling Only Model

<Inverter Unit>

MMY-MAP0501T8, MAP0601T8
MMY-MAP0801T8, MAP1001T8
MMY-MAP1201T8

Heat Pump Model

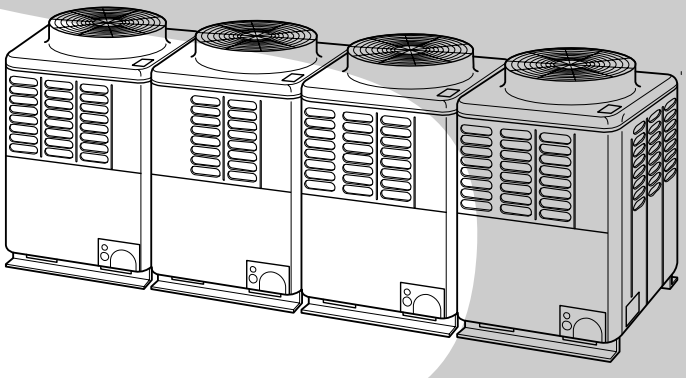
<Inverter Unit>

MMY-MAP0501HT8, MAP0601HT8
MMY-MAP0801HT8, MAP1001HT8
MMY-MAP1201HT8

Heat Pump Model

<Inverter Unit>

MMY-MAP0501HT7, MAP0601HT7
MMY-MAP0801HT7, MAP1001HT7
MMY-MAP1201HT7



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WARNINGS ON REFRIGERANT LEAKAGE

Check of Concentration Limit

Important

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.

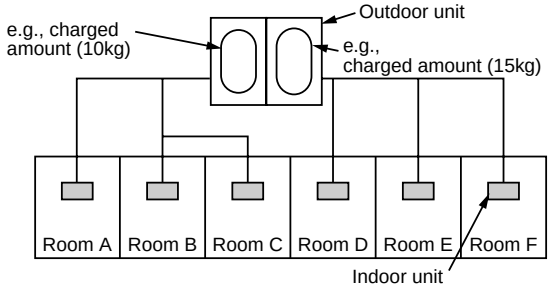
The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively. Suffocation from leakage of R410A is almost non-existent. With the recent increase in the number of high concentration buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.
Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air conditioners. If a single unit of the multi conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).
In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.
The concentration is as given below.

$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} \leq \text{Concentration limit (kg/m}^3\text{)}$$

The concentration limit of R410A which is used in multi air conditioners is 0.3kg/m³.

NOTE 1 :

If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.



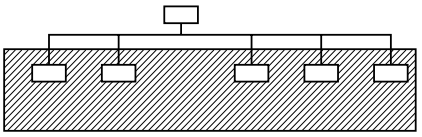
For the amount of charge in this example:

The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg.
The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

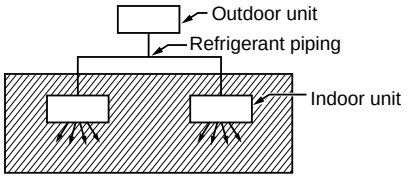
NOTE : 2

The standards for minimum room volume are as follows.

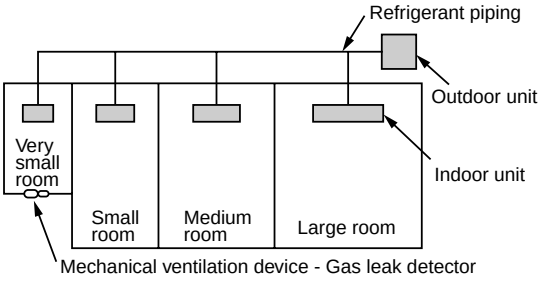
(1) No partition (shaded portion)



(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).

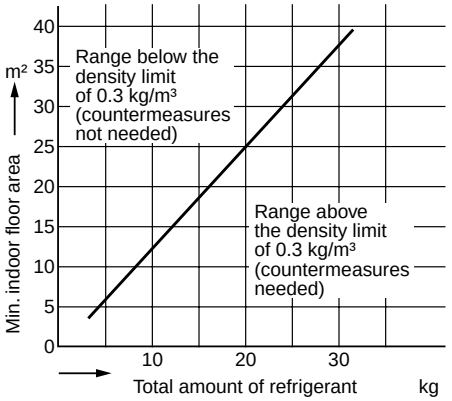


(3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



NOTE 3 :

The minimum indoor floor area compared with the amount of refrigerant is roughly as follows:
(When the ceiling is 2.7m high)



NOTE

A direct current motor is adopted for indoor fan motor in the Concealed Duct Standard Type air conditioner. Caused from its characteristics, a current limit works on the direct current motor. When replacing the high-performance filter or when opening the service board, be sure to stop the fan. If an above action is executed during the fan operation, the protective control works to stop the unit operation, and the check code “P12” may be issued. However it is not a trouble. When the desired operation has finished, be sure to reset the system to clear “P12” error code using the leak breaker of the indoor unit. Then push the operation stop button of the remote controller to return to the usual operation.

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SAFETY CAUTION

The important contents concerned to the safety are described on the product itself and on this Service Manual.

Please read this Service Manual after understanding the described items thoroughly in the following contents (Indications/Illustrated marks), and keep them.

[Explanation of indications]

Indication	Explanation
⚠ DANGER	Indicates contents assumed that an imminent danger causing a death or serious injury of the repair engineers and the third parties when an incorrect work has been executed.
⚠ WARNING	Indicates possibilities assumed that a danger causing a death or serious injury of the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.
⚠ CAUTION	Indicates contents assumed that an injury or property damage (∗) may be caused on the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.

∗ Property damage : Enlarged damage concerned to property, furniture, and domestic animal/pet

[Explanation of illustrated marks]

Mark	Explanation
	Indicates prohibited items (Forbidden items to do) The sentences near an illustrated mark describe the concrete prohibited contents.
	Indicates mandatory items (Compulsory items to do) The sentences near an illustrated mark describe the concrete mandatory contents.
	Indicates cautions (including danger/warning) The sentences or illustration near or in an illustrated mark describe the concrete cautious contents.

[Confirmation of warning label on the main unit]

Confirm that labels are indicated on the specified positions
(Refer to the Parts disassembly diagram (Outdoor unit).)

If removing the label during parts replace, stick it as the original.

⚠ DANGER	
 Turn off breaker.	**Turn "OFF" the breaker before removing the front panel and cabinet, otherwise an electric shock is caused by high voltage resulted in a death or injury.** During operation, a high voltage with 400V or higher of circuit (∗) at secondary circuit of the high-voltage transformer is applied. If touching a high voltage with the naked hands or body, an electric shock is caused even if using an electric insulator. ∗ : For details, refer to the electric wiring diagram.
 Execute discharge between terminals.	**When removing the front panel or cabinet, execute short-circuit and discharge between high-voltage capacitor terminals.** If discharge is not executed, an electric shock is caused by high voltage resulted in a death or injury. After turning off the breaker, high voltage also keeps to apply to the high-voltage capacitor.
 Prohibition	**Do not turn on the breaker under condition that the front panel and cabinet are removed.** An electric shock is caused by high voltage resulted in a death or injury.

⚠ WARNING	
 Check earth wires.	**Before troubleshooting or repair work, check the earth wire is connected to the earth terminals of the main unit, otherwise an electric shock is caused when a leak occurs.** If the earth wire is not correctly connected, contact an electric engineer for rework.
 Prohibition of modification.	**Do not modify the products.** Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.
 Use specified parts.	**For spare parts, use those specified (*).** If unspecified parts are used, a fire or electric shock may be caused. *: For details, refer to the parts list.
 Do not bring a child close to the equipment.	**Before troubleshooting or repair work, do not bring a third party (a child, etc.) except the repair engineers close to the equipment.** It causes an injury with tools or disassembled parts. Please inform the users so that the third party (a child, etc.) does not approach the equipment.
 Insulating measures	**Connect the cut-off lead cables with crimp contact, etc, put the closed end side upward and then apply a water-cut method, otherwise a leak or production of fire is caused at the users' side.**
 No fire	**When repairing the refrigerating cycle, take the following measures.** 1) Be attentive to fire around the cycle. When using a gas stove, etc, be sure to put out fire before work; otherwise the oil mixed with refrigerant gas may catch fire. 2) Do not use a welder in the closed room. When using it without ventilation, carbon monoxide poisoning may be caused. 3) Do not bring inflammables close to the refrigerant cycle, otherwise fire of the welder may catch the inflammables.
 Refrigerant	**Check the used refrigerant name and use tools and materials of the parts which match with it.** For the products which use R410A refrigerant, the refrigerant name is indicated at a position on the outdoor unit where is easy to see. To prevent miss-charging, the route of the service port is changed from one of the former R22. **For an air conditioner which uses R410A, never use other refrigerant than R410A. For an air conditioner which uses other refrigerant (R22, etc.), never use R410A.** If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused. **Do not charge refrigerant additionally.** If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of air conditioner characteristics or refrigerant over the specified standard amount is charged and an abnormal high pressure is applied to the inside of the refrigerating cycle resulted in cause of breakage or injury. Therefore if the refrigerant gas leaks, recover the refrigerant in the air conditioner, execute vacuuming, and then newly recharge the specified amount of liquid refrigerant. In this time, never charge the refrigerant over the specified amount. **When recharging the refrigerant in the refrigerating cycle, do not mix the refrigerant or air other than R410A into the specified refrigerant.** If air or others is mixed with the refrigerant, abnormal high pressure generates in the refrigerating cycle resulted in cause of injury due to breakage. **After installation work, check the refrigerant gas does not leak.** If the refrigerant gas leaks in the room, poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous. **Never recover the refrigerant into the outdoor unit.** When the equipment is moved or repaired, be sure to recover the refrigerant with recovering device. The refrigerant cannot be recovered in the outdoor unit; otherwise a serious accident such as breakage or injury is caused.
 Assembly/Cabling	**After repair work, surely assemble the disassembled parts, and connect and lead the removed cables as before. Perform the work so that the cabinet or panel does not catch the inner cables.** If incorrect assembly or incorrect cable connection was done, a disaster such as a leak or fire is caused at user's side.

⚠ WARNING	
 Insulator check	**After the work has finished, be sure to use an insulation tester set (500V mugger) to check the resistance is 2MΩ or more between the charge section and the non-charge metal section (Earth position).** If the resistance value is low, a disaster such as a leak or electric shock is caused at user's side.
 Ventilation	**When the refrigerant gas leaks during work, execute ventilation.** If the refrigerant gas touches to a fire, poisonous gas generates. A case of leakage of the refrigerant and the closed room full with gas is dangerous because a shortage of oxygen occurs. Be sure to execute ventilation.
 Be attentive to electric shock	**When checking the circuit inevitably under condition of the power-ON, use rubber gloves and others not to touch to the charging section.** If touching to the charging section, an electric shock may be caused.
 Compulsion	**When the refrigerant gas leaks, find up the leaked position and repair it surely.** If the leaked position cannot be found up and the repair work is interrupted, pump-down and tighten the service valve, otherwise the refrigerant gas may leak into the room. The poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous. **When installing equipment which includes a large amount of charged refrigerant such as a multi air conditioner in a sub-room, it is necessary that the density does not the limit even if the refrigerant leaks.** If the refrigerant leaks and exceeds the limit density, an accident of shortage of oxygen is caused. **For the installation/moving/reinstallation work, follow to the Installation Manual.** If an incorrect installation is done, a trouble of the refrigerating cycle, water leak, electric shock or fire is caused.
 Check after rerair	**After repair work has finished, check there is no trouble.** If check is not executed, a fire, electric shock or injury may be caused. For a check, turn off the power breaker.
	After repair work (installation of front panel and cabinet) has finished, execute a test run to check there is no generation of smoke or abnormal sound. If check is not executed, a fire or an electric shock is caused. Before test run, install the front panel and cabinet.
 Check after reinstallation	**Check the following items after reinstallation.** 1) The earth wire is correctly connected. 2) The power cord is not caught in the product. 3) There is no inclination or unsteadiness and the installation is stable. If check is not executed, a fire, an electric shock or an injury is caused.

⚠ CAUTION	
 Put on gloves	**Be sure to put on gloves (*) during repair work.** If not putting on gloves, an injury may be caused with the parts, etc. (*) Heavy gloves such as work gloves
 Cooling check	**When the power was turned on, start to work after the equipment has been sufficiently cooled.** As temperature of the compressor pipes and others became high due to cooling/heating operation, a burn may be caused.

• New Refrigerant (R410A)

This air conditioner adopts a new HFC type refrigerant (R410A) which does not deplete the ozone layer.

1. Safety Caution Concerned to New Refrigerant

The pressure of R410A is high 1.6 times of that of the former refrigerant (R22). Accompanied with change of refrigerant, the refrigerating oil has been also changed. Therefore, be sure that water, dust, the former refrigerant or the former refrigerating oil is not mixed into the refrigerating cycle of the air conditioner with new refrigerant during installation work or service work. If an incorrect work or incorrect service is performed, there is a possibility to cause a serious accident. Use the tools and materials exclusive to R410A to purpose a safe work.

2. Cautions on Installation/Service

(1) Do not mix the other refrigerant or refrigerating oil.

For the tools exclusive to R410A, shapes of all the joints including the service port differ from those of the former refrigerant in order to prevent mixture of them.

(2) As the use pressure of the new refrigerant is high, use material thickness of the pipe and tools which are specified for R410A.

(3) In the installation time, use clean pipe materials and work with great attention so that water and others do not mix in because pipes are affected by impurities such as water, oxide scales, oil, etc. Use the clean pipes.

Be sure to brazing with flowing nitrogen gas. (Never use gas other than nitrogen gas.)

(4) For the earth protection, use a vacuum pump for air purge.

(5) R410A refrigerant is azeotropic mixture type refrigerant. Therefore use liquid type to charge the refrigerant. (If using gas for charging, composition of the refrigerant changes and then characteristics of the air conditioner change.)

3. Pipe Materials

For the refrigerant pipes, copper pipe and joints are mainly used. It is necessary to select the most appropriate pipes to conform to the standard. Use clean material in which impurities adhere inside of pipe or joint to a minimum.

(1) Copper pipe

<Piping>

The pipe thickness, flare finishing size, flare nut and others differ according to a refrigerant type.

When using a long copper pipe for R410A, it is recommended to select “Copper or copper-base pipe without seam” and one with bonded oil amount 40mg/10m or less. Also do not use crushed, deformed, discolored (especially inside) pipes. (Impurities cause clogging of expansion valves and capillary tubes.)

<Flare nut>

Use the flare nuts which are attached to the air conditioner unit.

(2) Joint

The flare joint and socket joint are used for joints of the copper pipe. The joints are rarely used for installation of the air conditioner. However clear impurities when using them.

4. Tools

(1) Required Tools for R410A

Mixing of different types of oil may cause a trouble such as generation of sludge, clogging of capillary, etc. Accordingly, the tools to be used are classified into the following three types.

1) Tools exclusive for R410A (Those which cannot be used for conventional refrigerant (R22))
2) Tools exclusive for R410A, but can be also used for conventional refrigerant (R22)
3) Tools commonly used for R410A and for conventional refrigerant (R22)

The table below shows the tools exclusive for R410A and their interchangeability.

Tools exclusive for R410A (The following tools for R410A are required.)

Tools whose specifications are changed for R410A and their interchangeability

No.	Used tool	Usage	R410A air conditioner installation		Conventional air conditioner installation
			Existence of new equipment for R410A	Whether conventional equipment can be used	Whether new equipment can be used with conventional refrigerant
①	Flare tool	Pipe flaring	Yes	*(Note 1)	Yes
②	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	*(Note 1)	*(Note 1)
③	Torque wrench	Connection of flare nut	Yes	No	No
④	Gauge manifold	Evacuating, refrigerant charge, run check, etc.	Yes	No	No
⑤	Charge hose				
⑥	Vacuum pump adapter	Vacuum evacuating	Yes	No	Yes
⑦	Electronic balance for refrigerant charging	Refrigerant charge	Yes	Yes	Yes
⑧	Refrigerant cylinder	Refrigerant charge	Yes	No	No
⑨	Leakage detector	Gas leakage check	Yes	No	Yes
⑨	Charging cylinder	Refrigerant charge	(Note 2)	No	No

(Note 1) When flaring is carried out for R410A using the conventional flare tools, adjustment of projection margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary.

(Note 2) Charging cylinder for R410A is being currently developed.

General tools (Conventional tools can be used.)

In addition to the above exclusive tools, the following equipments which serve also for R22 are necessary as the general tools.

(1) Vacuum pump
Use vacuum pump by attaching vacuum pump adapter.
(2) Torque wrench
(3) Pipe cutter
(4) Reamer
(5) Pipe bender
(6) Level vial
(7) Screwdriver (+, –)
(8) Spanner or Monkey wrench
(9) Hole core drill
(10) Hexagon wrench (Opposite side 4mm)
(11) Tape measure
(12) Metal saw

Also prepare the following equipments for other installation method and run check.

(1) Clamp meter
(2) Thermometer
(3) IInsulation resistance tester
(4) Electroscope

5. Recharge of Refrigerant

When recharge of the refrigerant is required, charge the new refrigerant with the specified amount in the procedure as described below.

Recover the refrigerant and check there is no refrigerant in the equipment.

↓

Connect the charge hose to the packed valve service ports at gas side, liquid side, and balance side of the outdoor unit.

↓

Connect the charge hose to vacuum pump adaptor.

↓

Open the packed valves of the balance pipe fully at liquid and gas sides, and then return the valve at gas side a little to the closed side.

↓

Open fully PMV of the outdoor unit.
- Turn on power of the outdoor unit.
- Short CN30 on I/F P.C. board of the outdoor unit.
- Turn off power of the outdoor unit within 2 minutes after short-circuiting.

↓

Open fully the handle Low of the gauge manifold, and then turn on the power of vacuum pump for vacuuming.

↓

When the pressure has lowered until indication of the compound gauge pointed -0.1MPa (-76cmHg), open fully the handle Low and turn off the power of vacuum pump.

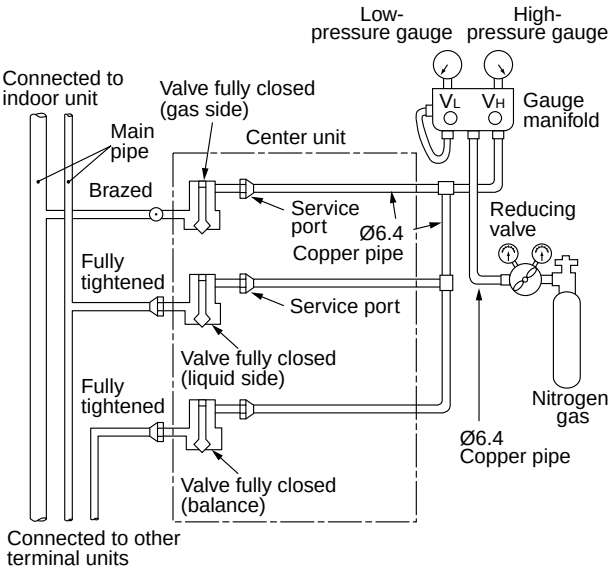
↓

Leave it as it is for 1 to 2 minutes and check the indicator of the compound gauge does not return.

↓

Set the refrigerant cylinder on the electron balance, connect the charge hose to connecting ports of the cylinder and the electron gauge, and then charge the liquid refrigerant from the service port at liquid side. (Shield with the gauge manifold so that refrigerant does not flow to gas side.)

(Charge the refrigerant as below.)

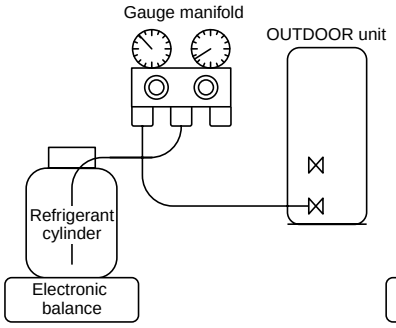


① Never charge the refrigerant over the specified amount.
② Do not charge the additional refrigerant.
If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of air conditioner characteristics or refrigerant over the specified standard amount is charged and an abnormal high pressure is applied to the inside of the refrigerating cycle resulted in cause of breakage or injury.

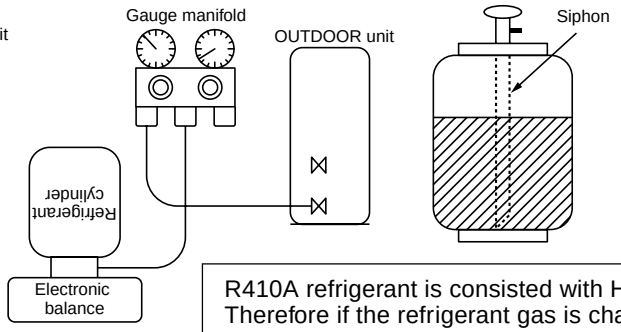
4mm-hexagonal wrench is required.

① Set the equipment so that liquid refrigerant can be charged.
② When using a cylinder with siphon pipe, liquid can be charged without inversing the cylinder.

[Cylinder with siphon]



[Cylinder without siphon]



R410A refrigerant is consisted with HFC mixed refrigerant. Therefore if the refrigerant gas is charged, the composition of the charged refrigerant changes and characteristics of the equipment changes.

6. Environment

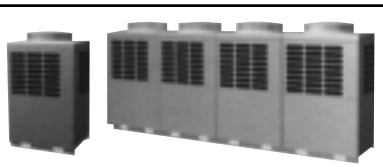
Use “Vacuum pump method” for an air purge (Discharge of air in the connecting pipe) in installation time.

- Do not discharge flon gas into the air to protect the earth environment.
- Using the vacuum pump method, clear the remained air (Nitrogen, etc.) in the unit. If the air remains, the pressure in the refrigerating cycle becomes abnormally high and an injury and others are caused due to burst.

1. OUTLINE

1-1. Components Lineup in Super Modular Multi Using High-efficiency Refrigerant R410A

■ Outdoor units

Corresponding HP			Inverter unit					Appearance
			5 HP	6 HP	8 HP	10 HP	12 HP	
Model name	Heat pump	MMY-	MAP0501HT8	MAP0601HT8	MAP0801HT8	MAP1001H8	MAP1201HT8	
	Heat pump	MMY-	MAP0501HT7	MAP0601HT7	MAP0801HT7	MAP1001HT7	MAP1201HT7	
	Cooling only	MMY-	MAP0501T8	MAP0601T8	MAP0801T8	MAP1001T8	MAP1201T8	
Cooling capacity (kW)			14.0	16.0	22.4	28.0	33.5	
Heating capacity (kW)			16.0	18.0	25.0	31.5	37.5	
No. of connectable indoor units			8	10	13	16	20	

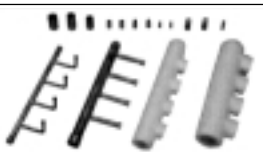
■ Combination of outdoor units

Corresponding HP		14 HP	16 HP	18 HP	20 HP	22 HP	22 HP	24 HP	24 HP
Combined Model	MMY-	AP1401HT8	AP1601HT8	AP1801HT8	AP2001HT8	AP2201HT8	AP2211HT8	AP2401HT8	AP2411HT8
	MMY-	AP1401HT7	AP1601HT7	AP1801HT7	AP2001HT7	AP2201HT7	AP2211HT7	AP2401HT7	AP2411HT7
	MMY-	AP1401T8	AP1601T8	AP1801T8	AP2001T8	AP2201T8	AP2211T8	AP2401T8	AP2411T8
Cooling capacity (kW)		38.4	45.0	50.4	56.0	61.5	61.5	68.0	68.0
Heating capacity (kW)		43.0	50.0	56.5	63.0	69.0	69.0	76.5	76.5
Combined outdoor units		8 HP	8 HP	10 HP	10 HP	8 HP	12 HP	8 HP	12 HP
		6 HP	8 HP	8 HP	10 HP	8 HP	10 HP	8 HP	12 HP
		—	—	—	—	6 HP	—	8 HP	—
		—	—	—	—	—	—	—	—
No. of connectable indoor units		23	27	30	33	37	37	40	40

Corresponding HP		26 HP	28 HP	30 HP	32 HP	32 HP	34 HP	34 HP	36 HP
Combined Model	MMY-	AP2601HT8	AP2801HT8	AP3001HT8	AP3201HT8	AP3211HT8	AP3401HT8	AP3411HT8	AP3601HT8
	MMY-	AP2601HT7	AP2801HT7	AP3001HT7	AP3201HT7	AP3211HT7	AP3401HT7	AP3411HT7	AP3601HT7
	MMY-	AP2601T8	AP2801T8	AP3001T8	AP3201T8	AP3211T8	AP3401T8	AP3411T8	AP3601T8
Cooling capacity (kW)		73.0	78.5	84.0	90.0	90.0	96.0	96.0	101.0
Heating capacity (kW)		81.5	88.0	95.0	100.0	100.0	108.0	108.0	113.0
Combined outdoor units		10 HP	10 HP	10 HP	8 HP	12 HP	10 HP	12 HP	10 HP
		8 HP	10 HP	10 HP	8 HP	10 HP	8 HP	12 HP	10 HP
		8 HP	8 HP	10 HP	8 HP	10 HP	8 HP	10 HP	8 HP
		—	—	—	8 HP	—	8 HP	—	8 HP
No. of connectable indoor units		43	47	48	48	48	48	48	48

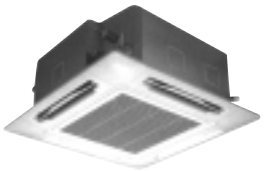
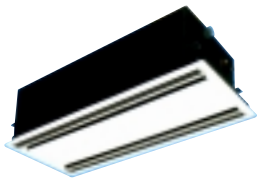
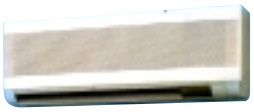
Corresponding HP		36 HP	38 HP	40 HP	42 HP	44 HP	46 HP	48 HP
Combined Model	MMY-	AP3611HT8	AP3801HT8	AP4001HT8	AP4201HT8	AP4401HT8	AP4601HT8	AP4801HT8
	MMY-	AP3611HT7	AP3801HT7	AP4001HT7	AP4201HT7	AP4401HT7	AP4601HT7	AP4801HT7
	MMY-	AP3611T8	AP3801T8	AP4001T8	AP4201T8	AP4401T8	AP4601T8	AP4801T8
Cooling capacity (kW)		101.0	106.5	112.0	118.0	123.5	130.0	135.0
Heating capacity (kW)		113.0	119.5	126.5	132.0	138.0	145.0	150.0
Combined outdoor units		12 HP	10 HP	10 HP	12 HP	12 HP	12 HP	12 HP
		12 HP	10 HP	10 HP	10 HP	12 HP	12 HP	12 HP
		12 HP	10 HP	10 HP	10 HP	10 HP	12 HP	12 HP
		—	8 HP	10 HP	10 HP	10 HP	10 HP	12 HP
No. of connectable indoor units		48	48	48	48	48	48	48

■ Branching joints and headers

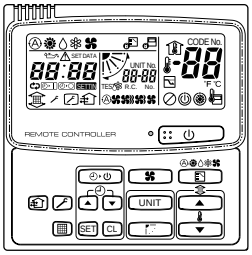
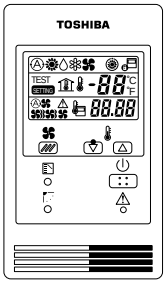
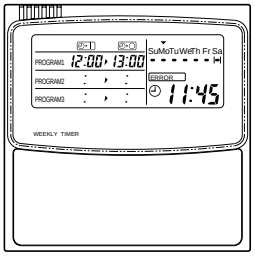
	Model RBM-	Usage			External view
Y-branch joint	BY53-E	Total indoor unit capacity code		Below 6.4	
	BY103-E	Total indoor unit capacity code		Over 6.4, below 14.2	
	BY203-E	Total indoor unit capacity code		Over 14.2, below 25.2	
	BY303-E	Total indoor unit capacity code		Over 25.2	
Branch header	HY1043-E	Max. 4 branches	Total indoor unit capacity code	Below 14.2	
	HY2043-E		Total indoor unit capacity code	Over 14.2, below 25.2	
	HY1083-E	Max. 8 branches	Total indoor unit capacity code	Below 14.2	
	HY2083-E		Total indoor unit capacity code	Over 14.2, below 25.2	
T-branch joint	BT13-E	The following 3 types of T joint pipes are collected as 1 set. • Balance pipe (Ø9.5) ×1 • Pipe at liquid side (Corresponded dia. Ø9.5 to Ø22.2) ×1 • Pipe at gas side (Corresponded dia. Ø15.9 to Ø38.1) × 1			

* In 1 line after header branch, the maximum total capacity codes 6.0 can be connected.
* The capacity code is indicated as HP equivalent. For details, refer to “Selection of refrigerant pipe”

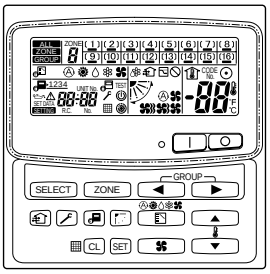
■ Indoor units

Type	Appearance	Model name	Capacity rank	Capacity code	Cooling capacity (kW)	Heating capacity (kW)
4-way Air Discharge Cassette Type		**MMU-AP0091H**	009 type	1	2.8	3.2
		MMU-AP0121H	012 type	1.25	3.6	4.0
		MMU-AP0151H,	015 type	1.7	4.5	5.0
		MMU-AP0181H	018 type	2	5.6	6.3
		MMU-AP0241H	024 type	2.5	7.1	8.0
		MMU-AP0271H	027 type	3	8.0	9.0
		MMU-AP0301H	030 type	3.2	9.0	10.0
		MMU-AP0361H	036 type	4	11.2	12.5
		MMU-AP0481H	048 type	5	14.0	16.0
		MMU-AP0561H	056 type	6	16.0	18.0
2-way Air Discharge Cassette Type		**MMU-AP0071WH**	007 type	0.8	2.2	2.5
		MMU-AP0091WH	009 type	1	2.8	3.2
		MMU-AP0121WH	012 type	1.25	3.6	4.0
		MMU-AP0151WH	015 type	1.7	4.5	5.0
		MMU-AP0181WH	018 type	2	5.6	6.3
		MMU-AP0241WH	024 type	2.5	7.1	8.0
		MMU-AP0271WH	027 type	3	8.0	9.0
		MMU-AP0301WH	030 type	3.2	9.0	10.0
		MMU-AP0481WH (CHINA only)	048 type	5	14.0	16.0
1-way Air Discharge Cassette Type		**MMU-AP0071YH**	007 type	0.8	2.2	2.5
		MMU-AP0091YH	009 type	1	2.8	3.2
		MMU-AP0121YH	012 type	1.25	3.6	4.0
		MMU-AP0151SH	015 type	1.7	4.5	5.0
		MMU-AP0181SH	018 type	2	5.6	6.3
		MMU-AP0241SH	024 type	2.5	7.1	8.0
Concealed Duct Standard Type		**MMD-AP0071BH**	007 type	0.8	2.2	2.5
		MMD-AP0091BH	009 type	1	2.8	3.2
		MMD-AP0121BH	012 type	1.25	3.6	4.0
		MMD-AP0151BH	015 type	1.7	4.5	5.0
		MMD-AP0181BH	018 type	2	5.6	6.3
		MMD-AP0241BH	024 type	2.5	7.1	8.0
		MMD-AP0271BH	027 type	3	8.0	9.0
		MMD-AP0301BH	030 type	3.2	9.0	10.0
		MMD-AP0361BH	036 type	4	11.2	12.5
		MMD-AP0481BH	048 type	5	14.0	16.0
		MMD-AP0561BH	056 type	6	16.0	18.0
Concealed Duct High Static Pressure Type		**MMD-AP0181H,**	018 type	2	5.6	6.3
		MMD-AP0241H	024 type	2.5	7.1	8.0
		MMD-AP0271H	027 type	3	8.0	9.0
		MMD-AP0361H	036 type	4	11.2	12.5
		MMD-AP0481H	048 type	5	14.0	16.0
		MMD-AP0721H	072 type	8	22.4	25.0
		MMD-AP0961H	096 type	10	28.0	31.5
Under Ceiling Type		**MMC-AP0151H**	015 type	1.7	4.5	5.0
		MMC-AP0181H	018 type	2	5.6	6.3
		MMC-AP0241H	024 type	2.5	7.1	8.0
		MMC-AP0271H	027 type	3	8.0	9.0
		MMC-AP0361H	036 type	4	11.2	12.5
		MMC-AP0481H	048 type	5	14.0	16.0
High Wall Type		**MMK-AP0071H**	007 type	0.8	2.2	2.5
		MMK-AP0091H	009 type	1	2.8	3.2
		MMK-AP0121H	012 type	1.25	3.6	4.0
		MMK-AP0151H	015 type	1.7	4.5	5.0
		MMK-AP0181H	018 type	2	5.6	6.3
		MMK-AP0241H	024 type	2.5	7.1	8.0
Floor Standing Cabinet Type		**MML-AP0071H**	007 type	0.8	2.2	2.5
		MML-AP0091H	009 type	1	2.8	3.2
		MML-AP0121H	012 type	1.25	3.6	4.0
		MML-AP0151H	015 type	1.7	4.5	5.0
		MML-AP0181H	018 type	2	5.6	6.3
		MML-AP0241H	024 type	2.5	7.1	8.0
Floor Standing Concealed Type		**MML-AP0071BH**	007 type	0.8	2.2	2.5
		MML-AP0091BH	009 type	1	2.8	3.2
		MML-AP0121BH	012 type	1.25	3.6	4.0
		MML-AP0151BH	015 type	1.7	4.5	5.0
		MML-AP0181BH	018 type	2	5.6	6.3
		MML-AP0241BH	024 type	2.5	7.1	8.0
Floor Standing Type		**MMF-AP0151H**	015 type	1.7	4.5	5.0
		MMF-AP0181H	018 type	2	5.6	6.3
		MMF-AP0241H	024 type	2.5	7.1	8.0
		MMF-AP0271H	027 type	3	8.0	9.0
		MMF-AP0361H	036 type	4	11.2	12.5
		MMF-AP0481H	048 type	5	14.0	16.0
		MMF-AP0561H	056 type	6	16.0	18.0

■ Remote controller switch

Name	Wired remote controller	Simple wired remote controller	Weekly timer
Appearance			
Model name	RBC-AMT21E	RBC-AS21E	RBC-EXW21E
Type			

Name	Wireless remote controller kit		
Appearance	 Receiver section 	 Receiver section 	 Receiver section laid separately 
Model name	RBC-AX22U (W)-E	RBC-AX22CE	TCB-AX21E
Type	Air Discharge Cassette type 4-way discharge type	Under Ceiling type	Separate sensor type

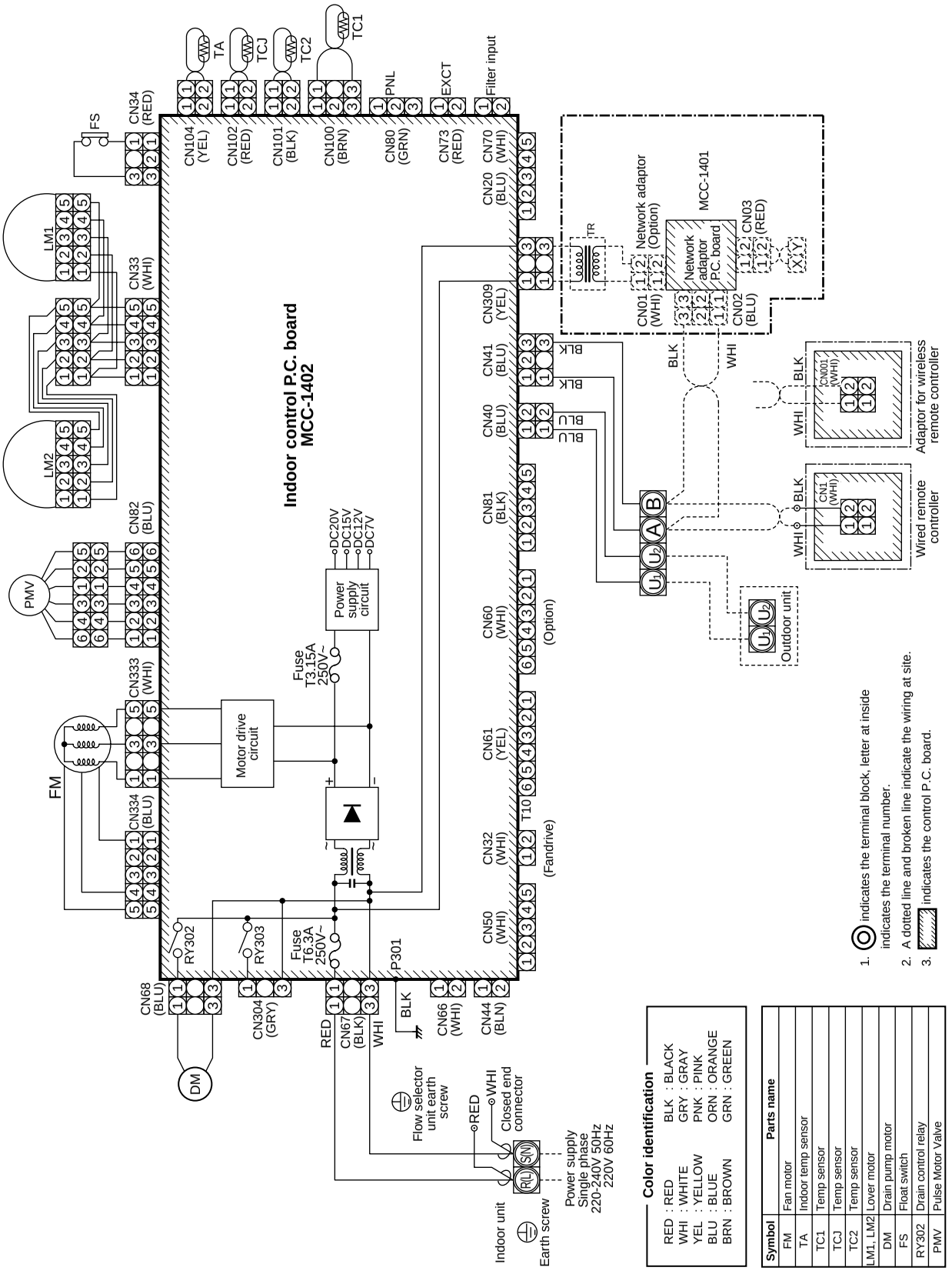
Name	Central remote controller
Appearance	
Model name	TCB-SC642TLE
Type	64 system center controller

2. WIRING DIAGRAM

2-1. Indoor Unit

2-1-1. 4-way Air Discharge Cassette Type

Model: MMU-AP0091H, AP0121H, AP0151H, AP0181H, AP0241H, MMU-AP0271H, AP0301H, AP0361H, AP0481H, AP0561H



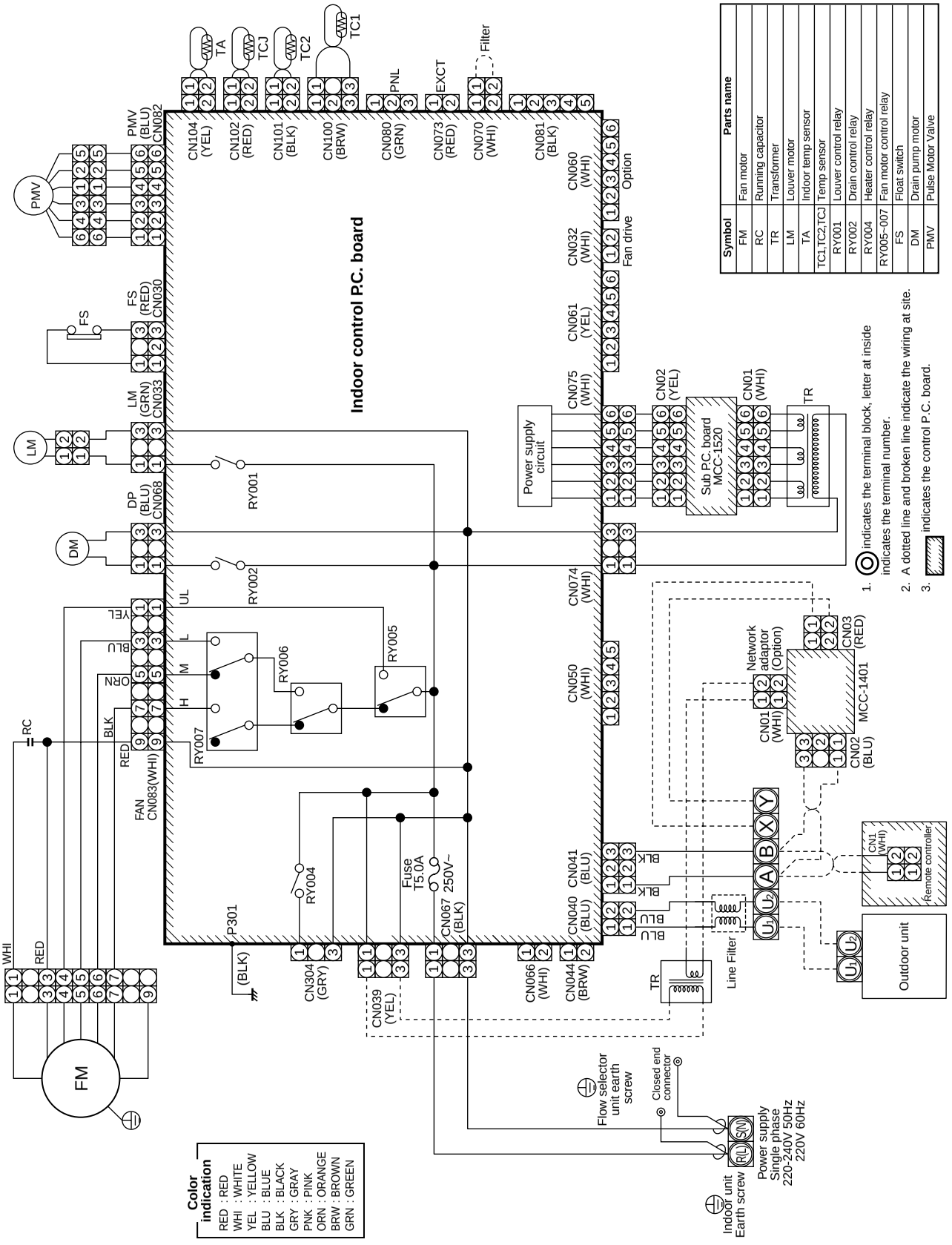
Color identification

RED	: RED	BLK	: BLACK
WHI	: WHITE	GRY	: GRAY
YEL	: YELLOW	PNK	: PINK
BLU	: BLUE	ORN	: ORANGE
BRN	: BROWN	GRN	: GREEN

Symbol	Parts name
FM	Fan motor
TA	Indoor temp sensor
TC1	Temp sensor
TCJ	Temp sensor
TC2	Temp sensor
LM1, LM2	Lover motor
DM	Drain pump motor
FS	Float switch
RY302	Drain control relay
PMV	Pulse Motor Valve

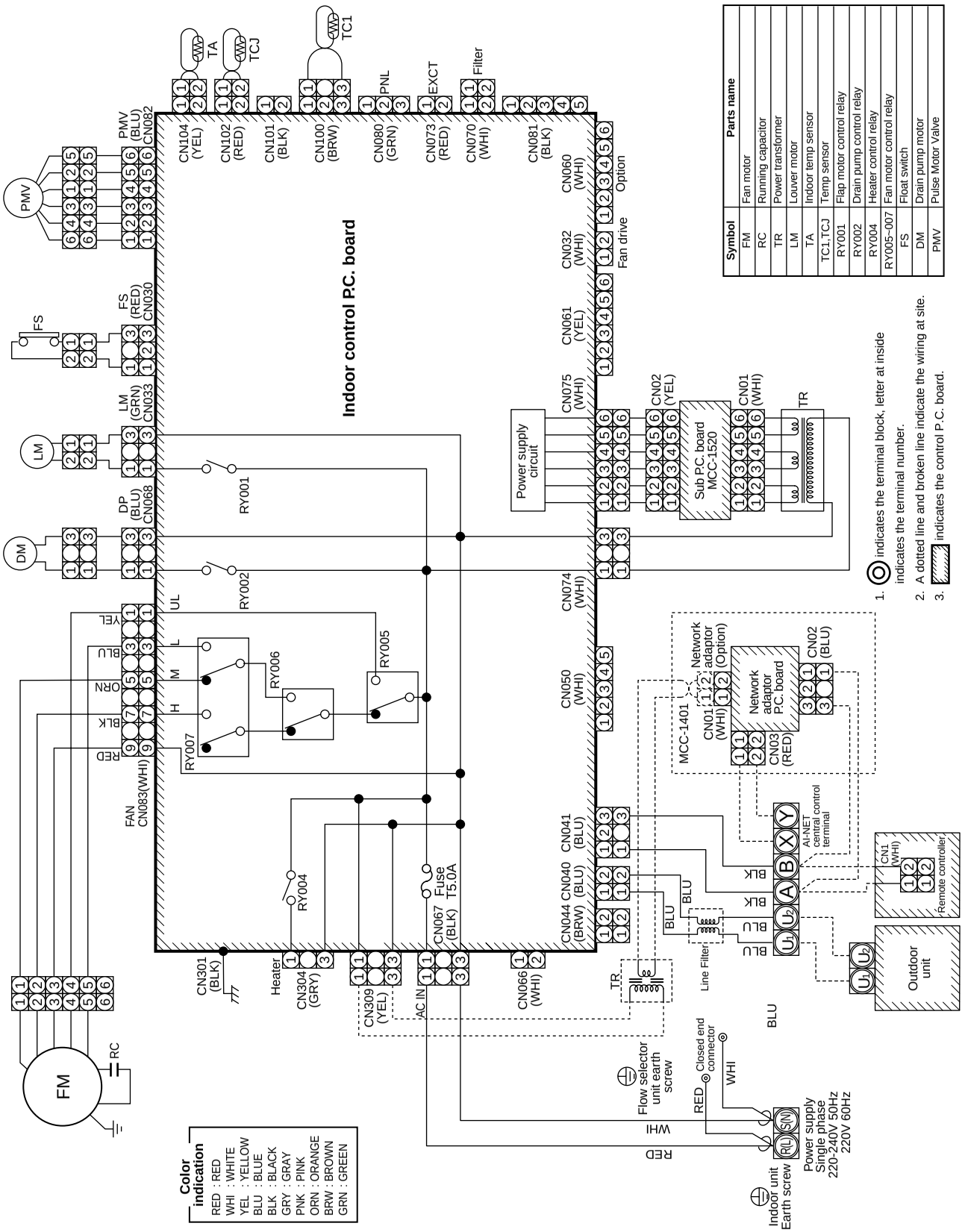
2-1-2. 2-way Air Discharge Cassette Type

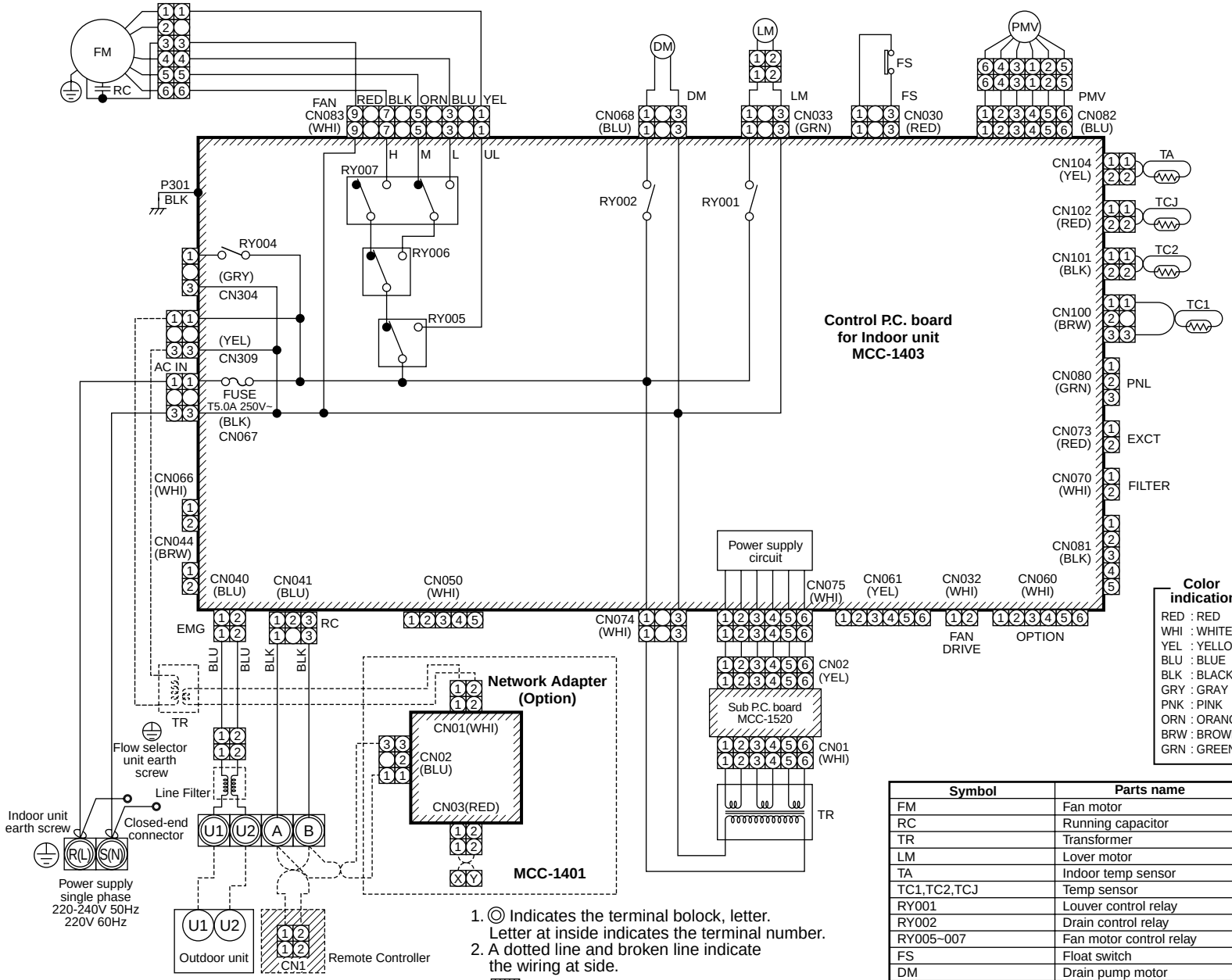
Model: MMU-AP0071WH, AP0091WH, AP0121WH, AP0151WH, AP0181WH, MMU-AP0241WH, AP0271WH, AP0301WH, AP0481WH



2-1-3. 1-way Air Discharge Cassette Type (Compact type)

Model: MMU-AP0071YH, AP0091YH, AP0121YH





Color indication

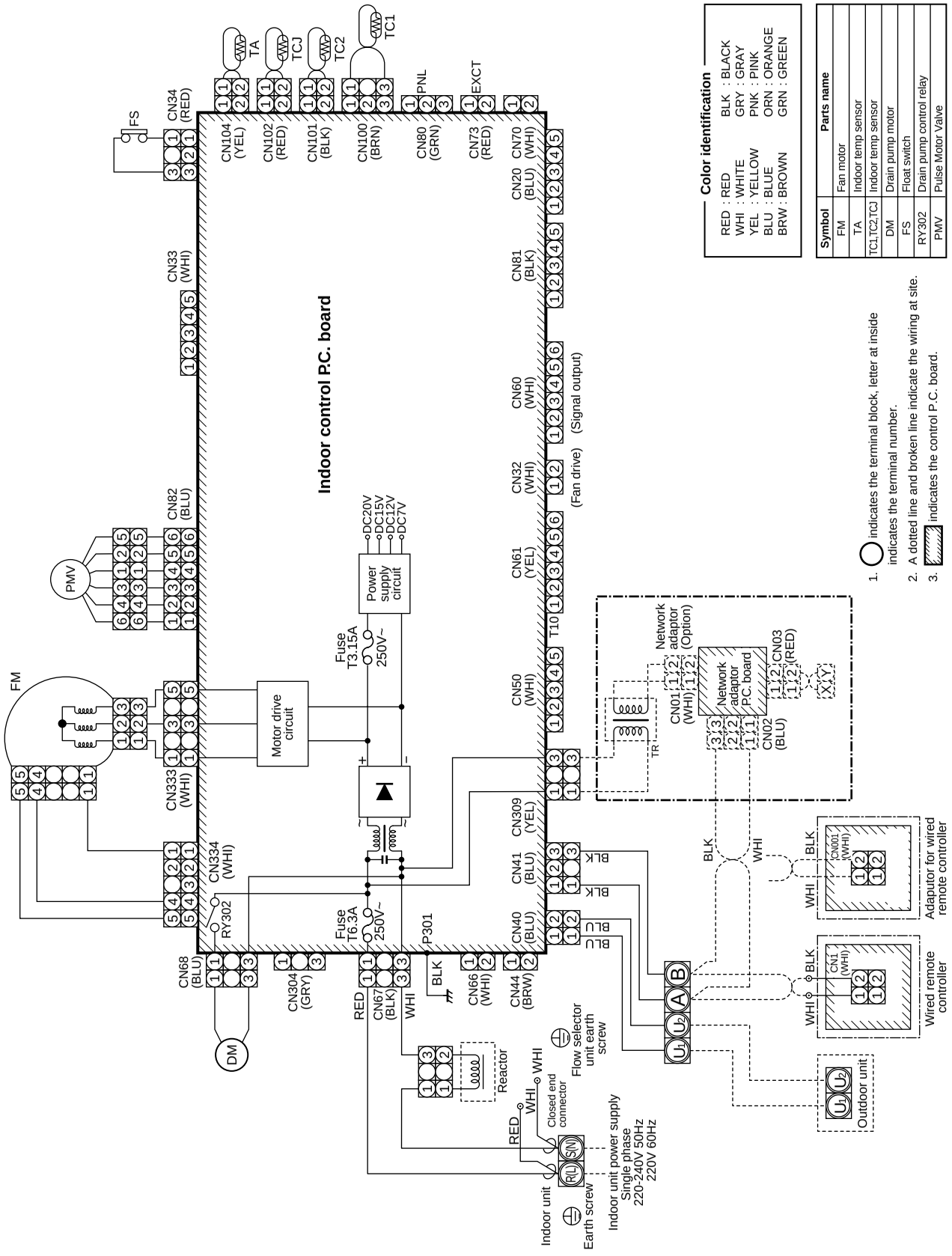
RED	: RED
WHI	: WHITE
YEL	: YELLOW
BLU	: BLUE
BLK	: BLACK
GRY	: GRAY
PNK	: PINK
ORN	: ORANGE
BRW	: BROWN
GRN	: GREEN

1. ◎ Indicates the terminal bolock, letter. Letter at inside indicates the terminal number.
2. A dotted line and broken line indicate the wiring at side.
3. ▨ indicate the control p.c. board.

Symbol	Parts name
FM	Fan motor
RC	Running capacitor
TR	Transformer
LM	Lover motor
TA	Indoor temp sensor
TC1,TC2,TCJ	Temp sensor
RY001	Louver control relay
RY002	Drain control relay
RY005~007	Fan motor control relay
FS	Float switch
DM	Drain pump motor
PMV	Pulse motor valve

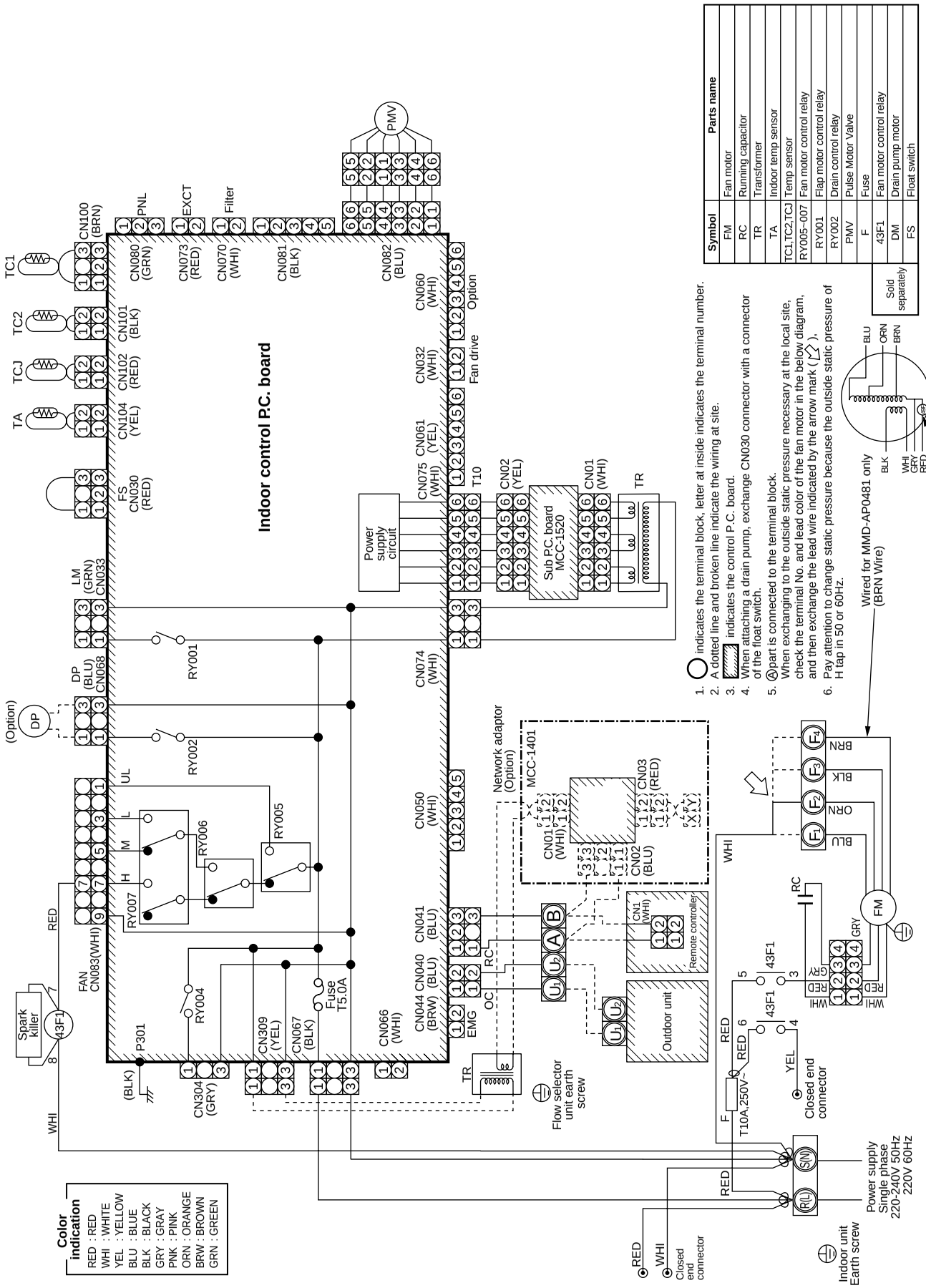
2-1-4. Concealed Duct Standard Type

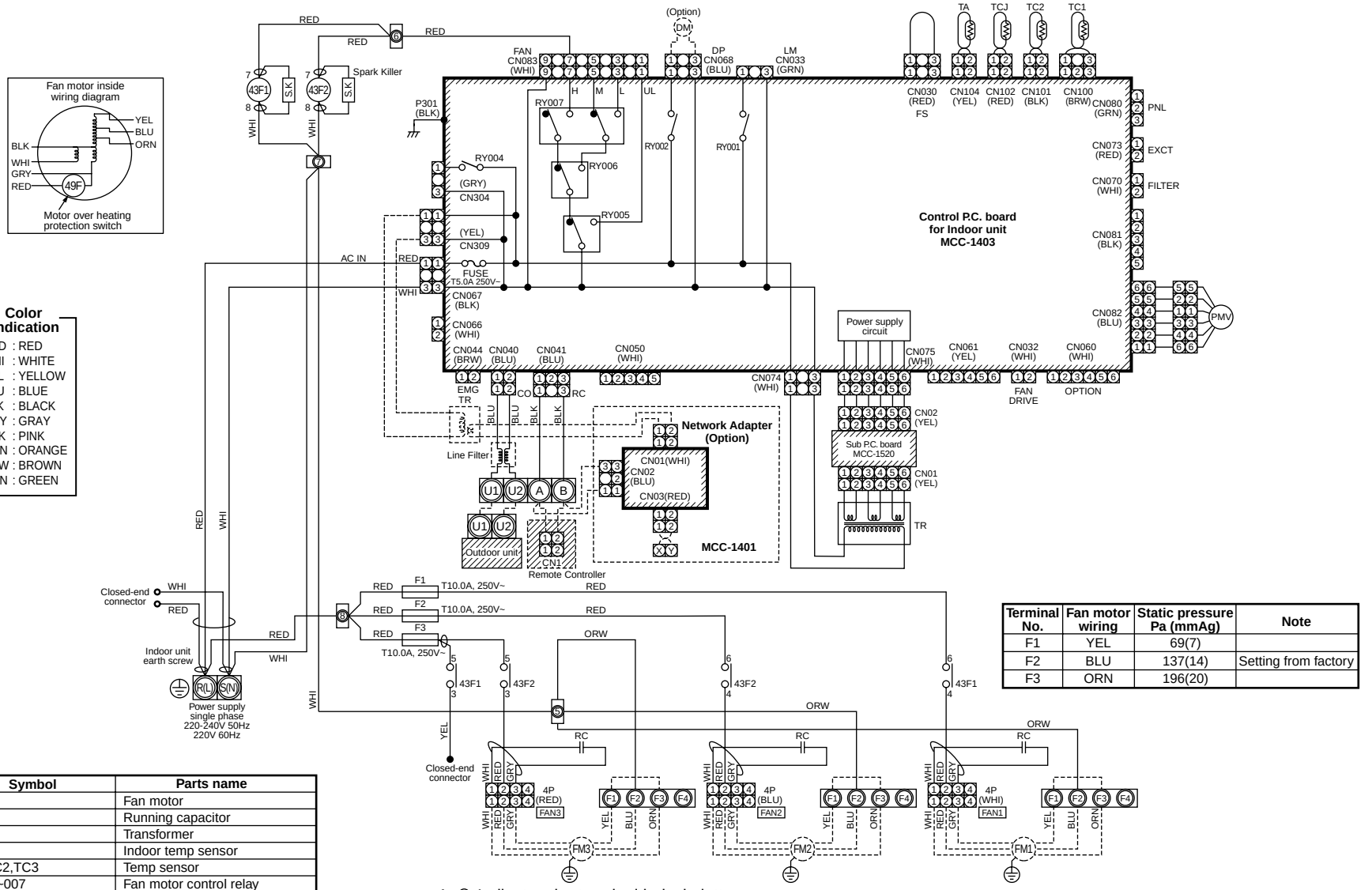
Model: MMD-AP0071BH, AP0091BH, AP0121BH, AP0151BH, AP0181BH, AP0241BH
MMD-AP0271BH, AP0301BH, AP0361BH, AP0481BH, AP0561BH



2-1-5. Concealed Duct High Static Pressure Type

Model: MMD-AP0181H, AP0241H, AP0271H, AP0361H, AP0481H





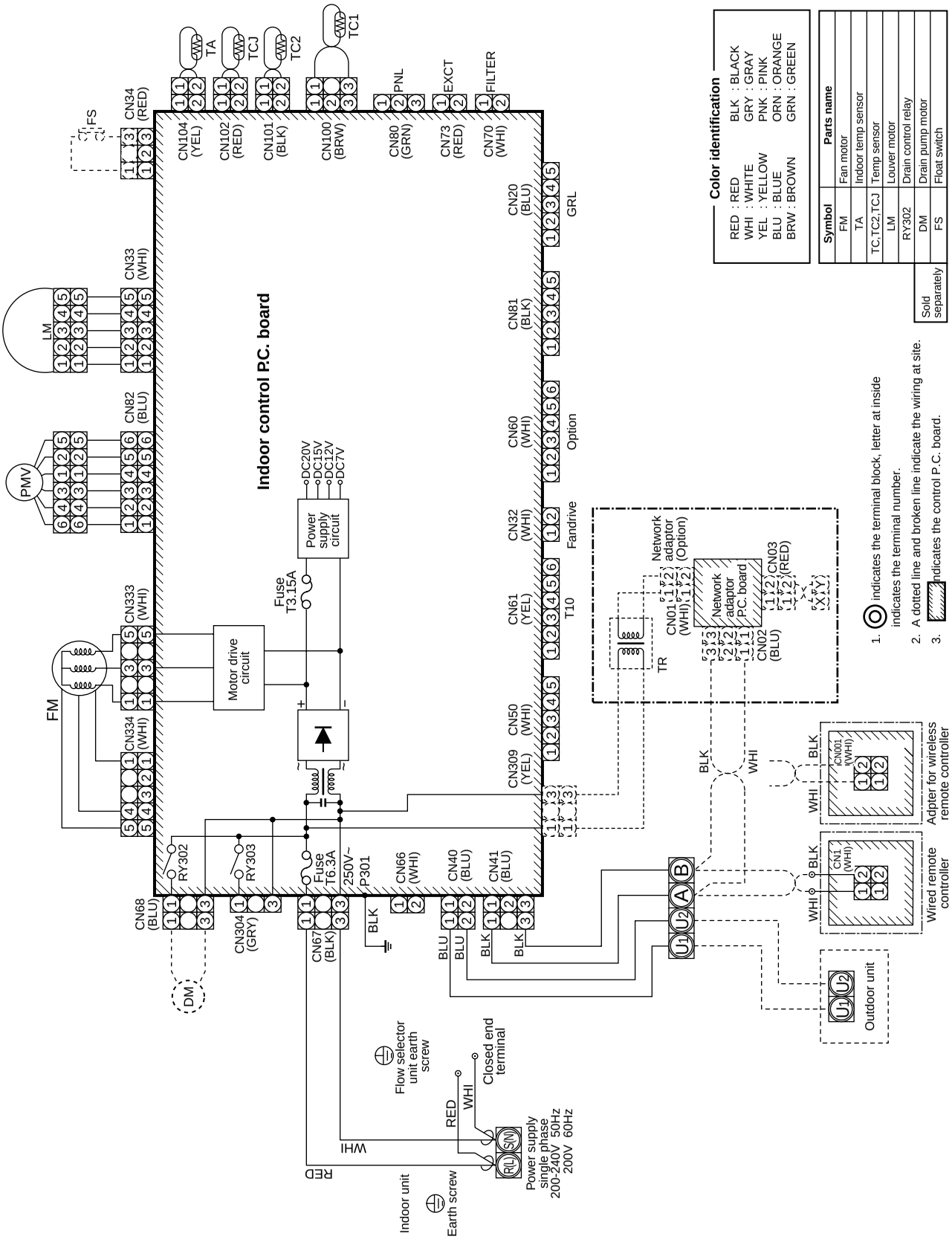
Terminal No.	Fan motor wiring	Static pressure Pa (mmAg)	Note
F1	YEL	69(7)	
F2	BLU	137(14)	Setting from factory
F3	ORN	196(20)	

Symbol	Parts name	
FM	Fan motor	
RC	Running capacitor	
TR	Transformer	
TA	Indoor temp sensor	
TC1,TC2,TC3	Temp sensor	
RY005~007	Fan motor control relay	
RY001	Louver control relay	
RY002	Drain control relay	
PMV	Pulse motor valve	
F1~3	Fuse for fan motor	
43F1,43F2	Fan motor control relay	
DM	Drain pump motor	Sold separately
FS	Float switch	

1. ◎ Indicates the terminal bolock, letter. Letter at inside indicates the terminal number.
2. A dotted line and broken line indicate the wiring at side.
3. ▨ indicate the control p.c. board.
4. When installing the drain pump connector the froat switch connector to CN030 connector.
5. Ⓐ Position is connected to terminal block when change to static pressure. Exchange the lead wire of arrow ⇨ position after check the terminal number as figure and lead wire's color of fan motor.
6. When midifiy the high tap, to care the static pressure are differ by 50Hz or 60Hz.

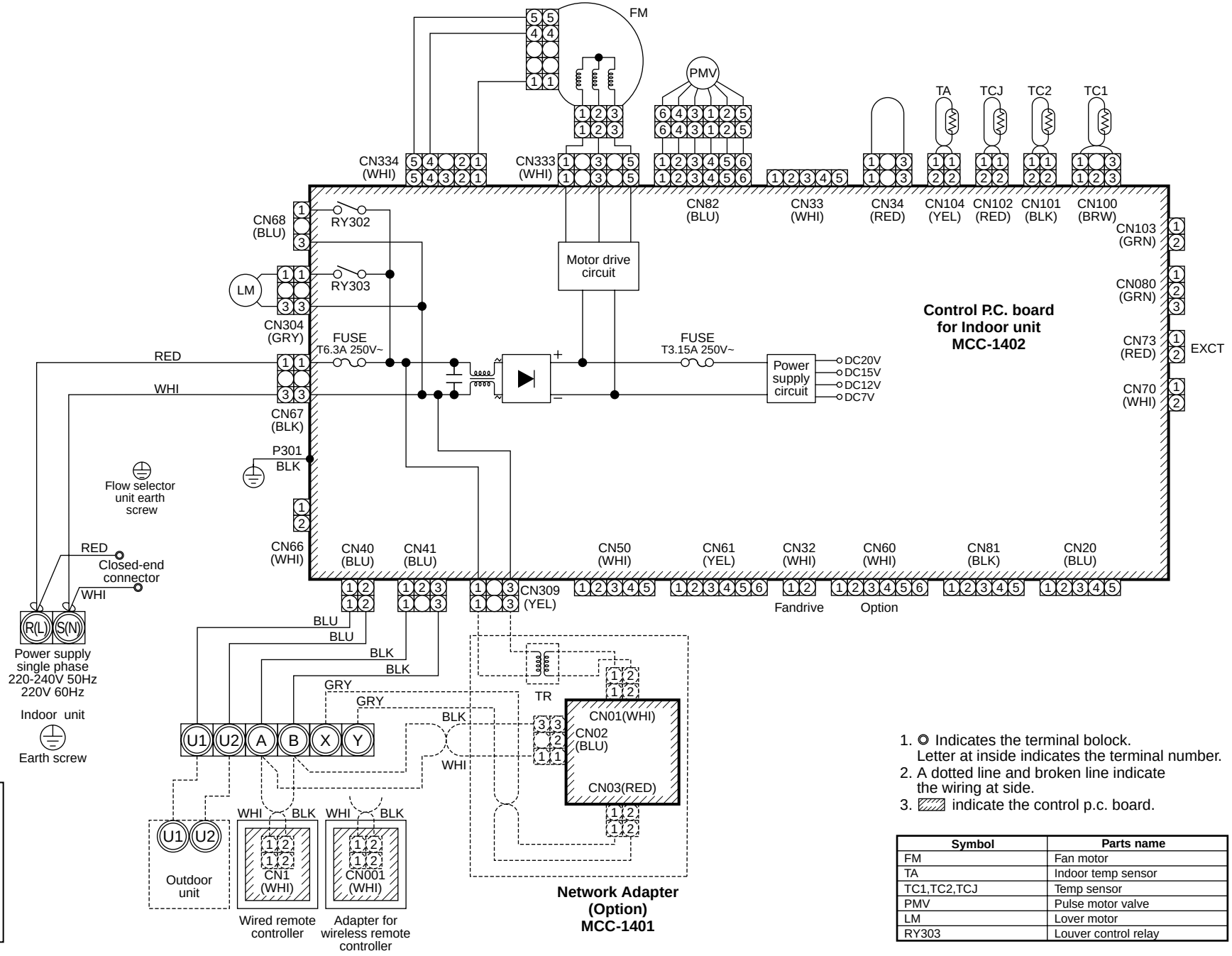
2-1-6. Under Ceiling Type

Model: MMC-AP0151H, AP0181H, AP0241H, AP0271H, AP0361H, AP0481H



2-1-7. High Wall Type

Model: MMK-AP0071H, AP0091H, AP0121H, AP0151H, AP0181H, AP0241H



Color indication

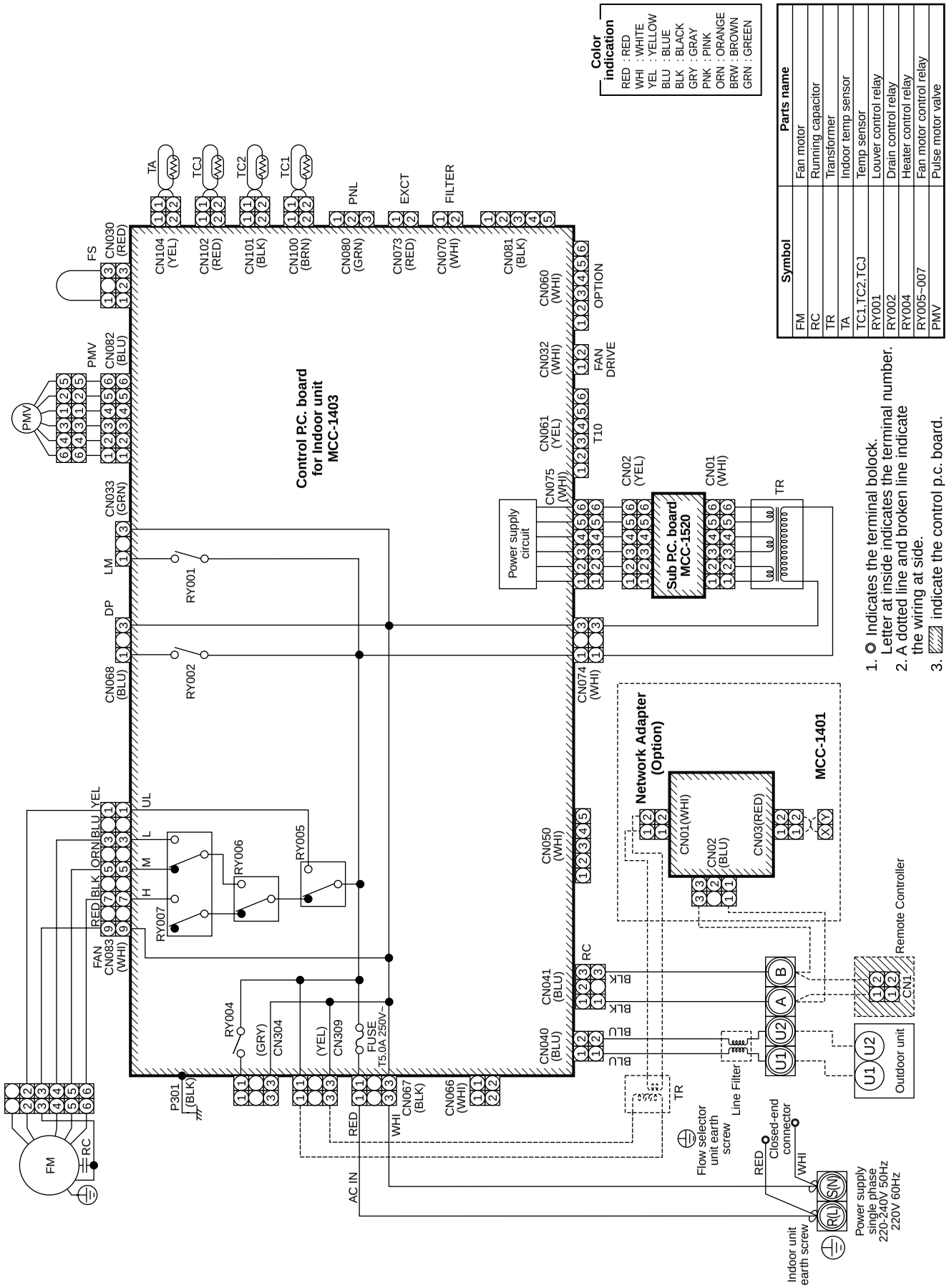
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WHI	: WHITE
YEL	: YELLOW
BLU	: BLUE
BLK	: BLACK
GRY	: GRAY
PNK	: PINK
ORN	: ORANGE
BRW	: BROWN
GRN	: GREEN

1. ◎ Indicates the terminal bolock. Letter at inside indicates the terminal number.
2. A dotted line and broken line indicate the wiring at side.
3. ▨ indicate the control p.c. board.

Symbol	Parts name
FM	Fan motor
TA	Indoor temp sensor
TC1,TC2,TCJ	Temp sensor
PMV	Pulse motor valve
LM	Lover motor
RY303	Louver control relay

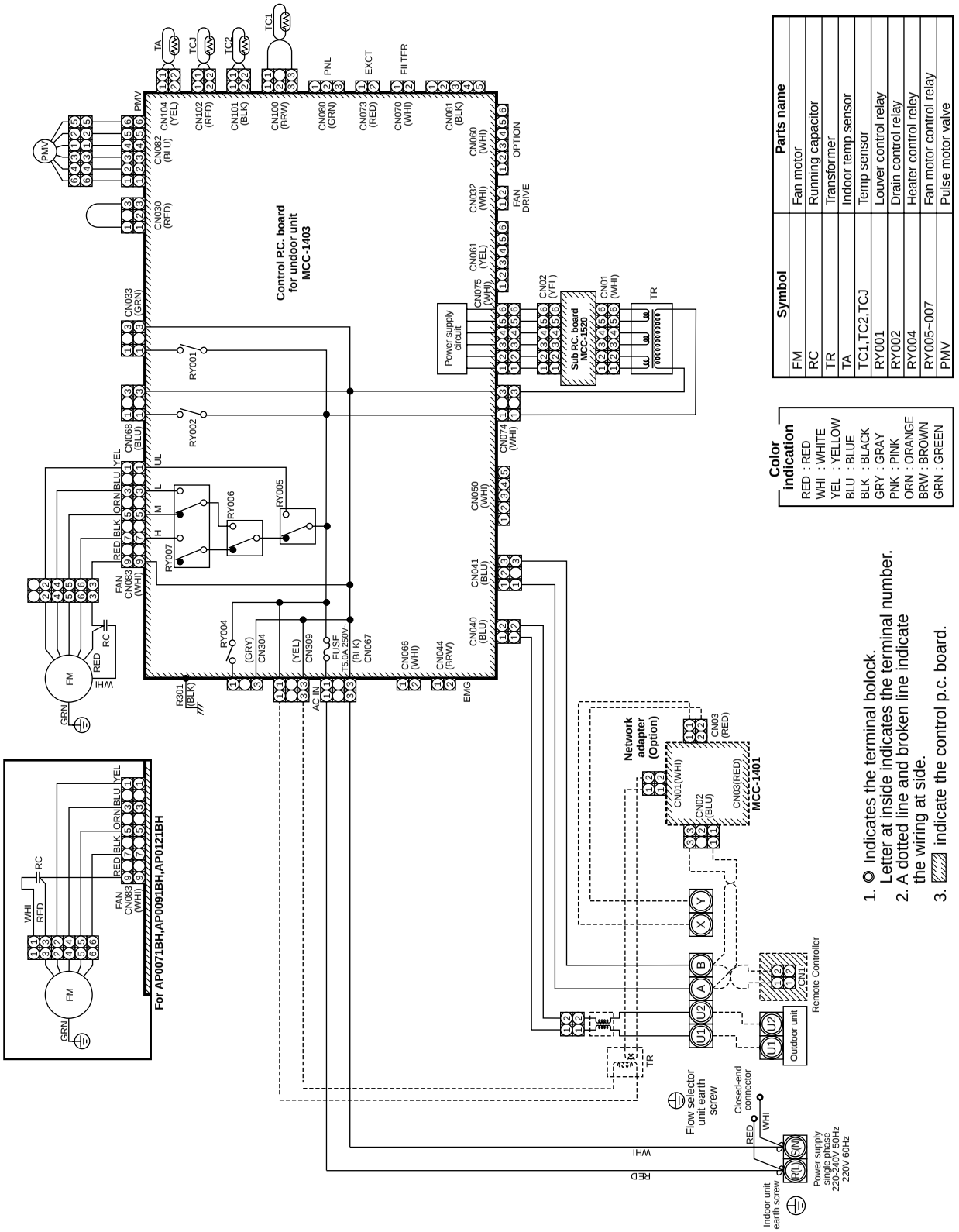
2-1-8. Floor Standing Cabinet Type

Model: MML-AP0071H, AP0091H, AP0121H, AP0151H, AP0181H, AP0241H



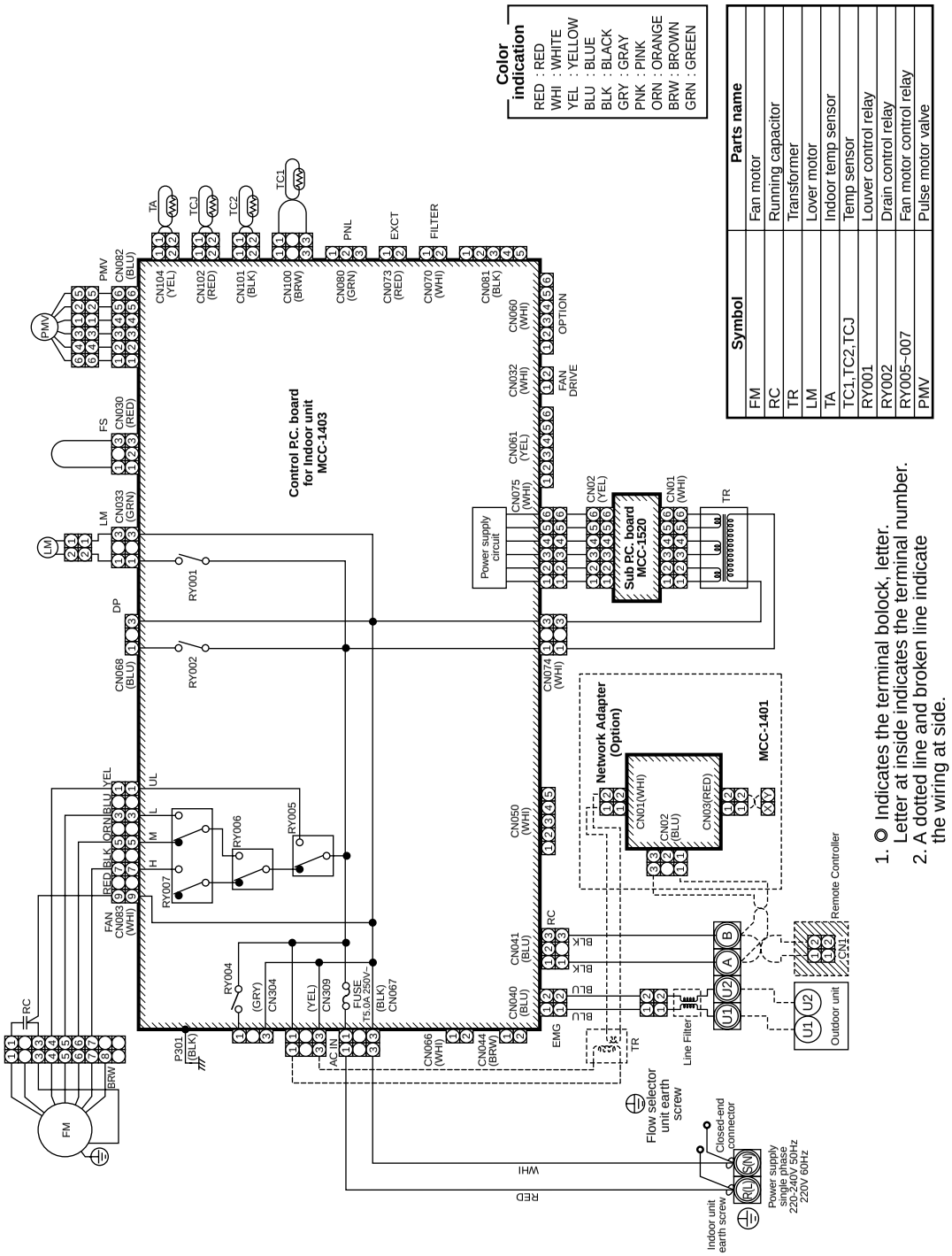
2-1-9. Floor Standing Concealed Type

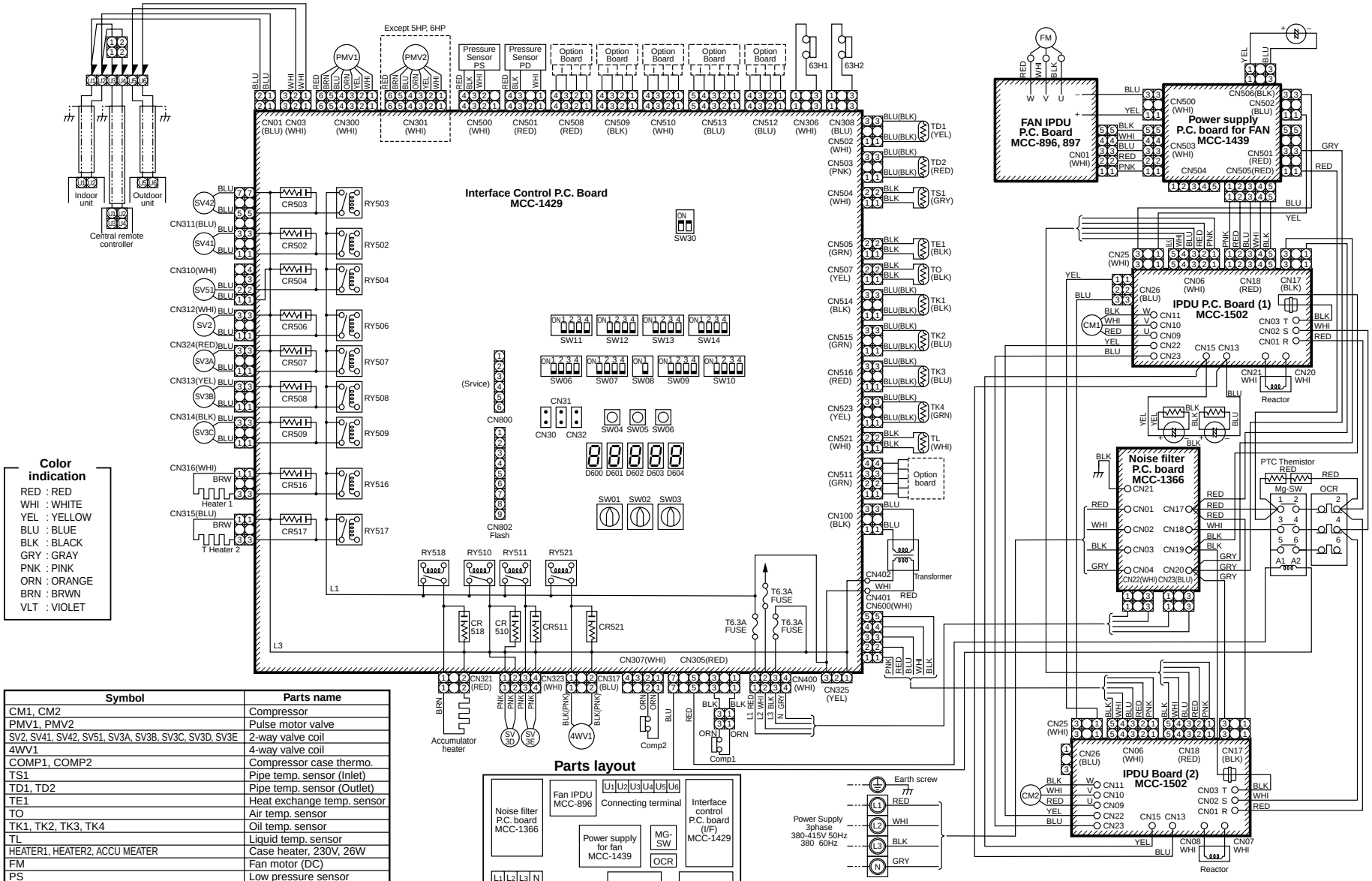
Model: MML-AP0071BH, AP0091BH, AP0121BH, AP0151BH, AP0181BH, AP0241BH



2-1-10. Floor Standing Type

Model: MMF-AP0151H, AP0181H, AP0241H, AP0271H, AP0361H, AP0481H, AP0561H





Color indication

RED	: RED
WHI	: WHITE
YEL	: YELLOW
BLU	: BLUE
BLK	: BLACK
GRY	: GRAY
PNK	: PINK
ORN	: ORANGE
BRN	: BRWN
VLT	: VIOLET

Symbol	Parts name
CM1, CM2	Compressor
PMV1, PMV2	Pulse motor valve
SV2, SV41, SV42, SV51, SV3A, SV3B, SV3C, SV3D, SV3E	2-way valve coil
4WV1	4-way valve coil
COMP1, COMP2	Compressor case thermo.
TS1	Pipe temp. sensor (Inlet)
TD1, TD2	Pipe temp. sensor (Outlet)
TE1	Heat exchange temp. sensor
TO	Air temp. sensor
TK1, TK2, TK3, TK4	Oil temp. sensor
TL	Liquid temp. sensor
HEATER1, HEATER2, ACCU MEATER	Case heater, 230V, 26W
FM	Fan motor (DC)
PS	Low pressure sensor
PD	High pressure sensor
63H1, 63H2	High pressure switch
MG-SW	Magnet switch
OCR	Overcurrent relay

1. The two-dot chain line indicates wiring at the local site, and the dashed line indicates accessories sold separately and service cables, respectively.
2. ◎, ○, and □ indicate the terminal blocks and the numerals indicate the terminal numbers.
3. ▨ indicates P.C. board.
   * Be sure to fix the electric parts cover surely with two screws. (Otherwise water enters into the box resulting in a trouble.)

3. PARTS RATING

3-1. Indoor Unit

4-way Air Discharge Cassette Type

Model MMU-AP	0091H	0121H	0151H	0181H	0241H	0271H	0301H
Fan motor	SWF-230-60-1						
Drain pump motor	ADP-1409						
Float switch	FS-0218-102						
TA sensor	Lead wire length : 155mm						
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)						
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)						
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)						
Pulse motor	EDM-MD12TF-3						
Pulse motor valve	EDM-B25YGTF		EDM-B40YGTF				
Louver motor (panel)	MP24GA						

Model MMU-AP	0361H	0481H	0561H
Fan motor	SWF-200-90-1		
Drain pump motor	ADP-1409		
Float switch	FS-0218-102		
TA sensor	Lead wire length : 155mm		
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)		
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)		
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)		
Pulse motor	EDM-MD12TF-3		
Pulse motor valve	EDM-B60YGTF-1		
Louver motor (panel)	MP24GA		

2-way Air Discharge Cassette Type

Model MMU-AP	0071WH	0091WH	0121WH	0151WH	0181WH
Fan motor	AF-230-53-4G			AF-230-39-4B	
Running condenser for fan motor	AC 400V, 1µF			AC 450V, 2µF	
Running capacitor for fan motor	AC 400V, 1.0µF			AC 450V, 2.0µF	
Drain pump motor	PJD-05230TF-1				
Float switch	FS-0208-608				
Control P.C. board transformer	TT-13				
Pulse motor	EDM-MD12TF-3				
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF	
TA sensor	Lead wire length : 268mm				
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)				
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)				
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)				

Model MMU-AP	0241WH	0271WH	0301WH	0481WH
Fan motor	AF-200-53-4F			AF-200-92-4B
Running condenser for fan motor	AC 450V, 2.5µF		AC 450V, 3µF	AC 450V, 5µF
Running capacitor for fan motor	AC 450V, 2.5µF		AC 450V, 3.5µF	AC 500V, 5µF
Drain pump motor	PJD-05230TF-1			
Float switch	FS-0208-608			
Control P.C. board transformer	TT-13			
Pulse motor	EDM-MD12TF-3			
Pulse motor valve	EDM-B40YGTF			EDM-B60YGTF-1
TA sensor	Lead wire length : 268mm			
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)			
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)			
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)			

1-way Air Discharge Cassette (Compact type) Type

Model MMU-AP	0071YH	0091YH	0121YH
Fan motor	AF-200-22-4N-1		
Running capacitor for fan motor	AC 400V, 1µF		
Drain pump motor	PJD-05230TF-1		
Float switch	FS-0208-602		
Control P.C. board transformer	TT-13		
Pulse motor	EDM-MD12TF-3		
Pulse motor valve	EDM-B25YGTF		
TA sensor	Lead wire length : 818mm		
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)		
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)		

Model MMU-AP	0151SH	0181SH	0241SH
Fan motor	AF-200-34-4D		
Running capacitor for fan motor	AC 450V, 1.5µF		AC 500V, 2.5µF
Drain pump motor	PJD-05230TF-2		
Float switch	FS-0208-603		
Control P.C. board transformer	TT-13		
Pulse motor	EDM-MD12TF-3		
Pulse motor valve	EDM-B40YGTF		
TA sensor	Lead wire length : 155mm Vinyl tube		
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)		
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)		
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)		

Concealed Duct Standard Type

Model MMD-AP	0071BH	0091BH	0121BH	0151BH	0181BH
Fan motor	ICF-280-120-2				
Drain pump motor	ADP-1409				
Float switch	FS-0218-102				
Pulse motor	EDM-MD12TF-3				
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF	
TA sensor	Lead wire length : 618mm				
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)				
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)				
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)				

Model MMD-AP	0241BH	0271BH	0301BH	0361BH	0481BH	0561BH
Fan motor	ICF-280-120-1			ICF-280-120-2		
Drain pump motor	ADP-1409					
Float switch	FS-0218-102					
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B40YGTF			EDM-B60YGTF-1		
TA sensor	Lead wire length : 618mm					
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)					

Concealed Duct High Static Pressure Type

Model MMD-AP	0181H	0241H	0271H	0361H	0481H
Fan motor	STF-200-160-4B	STF-200-160-4A		STF-200-260-4C	STF-200-260-4B
Running condenser for fan motor	AC 500V, 4μF	AC 400V, 8μF		AC 450V, 6μF	AC 400V, 8μF
Drain pump motor	ADP-1409				
Float switch	FS-0218-102-6				
Pulse motor	EDM-MD12TF-3				
Pulse motor valve	EDM-B40YGTF			EDM-B60YGTF-1	
TA sensor	Lead wire length : 1200mm				
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)				
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)				
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)				

Model MMD-AP	0721H	0961H
Fan motor	STF-200-370-4A	
Running condenser for fan motor	AC 450V, 12μF	
Drain pump motor	ADP-1409	
Float switch	FS-0218-102-6	
Pulse motor	EDM-MD12TF-3	
Pulse motor valve	EDM-BAOYGTF-1	
TA sensor	Lead wire length : 818mm	
TC1 sensor	Ø4 size lead wire length : 2000mm Vinyl tube (Blue)	
TC2 sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Black)	
TCJ sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Red)	

Under Ceiling Type

Model MMC-AP	0151H	0181H	0241H	0271H	0361H	0481H
Fan motor	SWF-280-60-1		SWF-280-60-2		SWF-280-120-2	
Driving motor for horizontal grille	MP24GA1					
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B40YGTF			EDM-B60YGTF-1		
TA sensor	Lead wire length : 155mm Vinyl tube					
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)					

High Wall Type

Model MMK-AP	0071H	0091H	0121H	0151H	0181H	0241H
Fan motor	ICF-280-120-3					
Driving motor for horizontal grille	MT8-3-6					
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF		
TA sensor	Lead wire length : 818mm Vinyl tube					
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)					

Floor Standing Cabinet Type

Model MML-AP	0071H	0091H	0121H	0151H	0181H	0241H
Fan motor	AF-200-19-4F		AF-200-45-4F		AF200-70-4K	
Running condenser for fan motor	AC450V, 1.2µF		AC400V, 1.8µF		AC450V, 2µF	
Transformer	TT13					
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B25YGTF		EDM-B40YGTF			
TA sensor	Lead wire length : 818mm Vinyl tube					
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)					

Floor Standing Concealed Type

Model MML-AP	0071BH	0091BH	0121BH	0151BH	0181BH	0241BH
Fan motor	AF-200-19-4G			AF-200-70-4K		
Running condenser for fan motor	AC450V, 1.5µF			AC450V, 1µF		AC450V, 2µF
Transformer	TT-13					
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF		
TA sensor	Lead wire length : 818mm Vinyl tube					
TC1 sensor	Ø4 size lead wire length : 2000mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Red)					

Floor Standing Type

Model MMF-AP	0151H	0181H	0241H	0271H	0361H	0481H	0561H
Fan motor	AF-200-37R		AF-200-63T		AF-200-110M-1	AF-200-160H-1	
Running condenser for fan motor	AC500V, 3µF		AC500V, 3.5µF		AC500V, 4µF		
Transformer	TT-13						
Pulse motor	EDM-MD12TF-3						
Pulse motor valve	EDM-B40YGTF				EDM-B60YGTF-1		
Driving motor for vertical flap	MT8-3-9						
TA sensor	Lead wire length : 1200mm Vinyl tube						
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)						
TC2 sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Black)						
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)						

3-2. Outdoor Unit

Cooling Only Model

Model MMY-	MAP0501*T8	MAP0601*T8	MAP0801*T8	MAP1001*T8	MAP1201*T8
Compressor	DA351A3FB-23M	Output: : 3.0kW × 2	DA421A3FB-23M	Output: : 3.75kW × 2	
4-way valve coil (Heat pump only)	VHV-01AJ502C1	AC220-240V 50/60Hz	LB64046	AC220-240V 50/60Hz	
Pulse motor valve coil	VPV-MOAJ524C0		HAM-MD12TF-3	DC12V	
2-way valve coil	VPV-122DQ1		AC220–240V 50/60Hz		
			SV2, SV3D, SV42		
			SV3A, SV3B, SV3C, SV3E, SV41, SV5		
2-way valve	VPV-122DQ1		SV2, SV3C, SV3D, SV3E		
	VPV-303DQ1		SV3A, SV41, SV42, SV5		
	VPV-603DQ2		SV3B		
High-pressure SW	ACB-JB215		OFF : 3.73MPa, ON : 2.9MPa		
Pressure sensor (For high pressure)	150XA4-H3		0.5 to 3.5V / 0 to 0.98MPa		
Pressure sensor (For low pressure)	150XA4-L1		0.5 to 4.3V / 0 to 3.73MPa		
Fan motor	MF-230-600-2		DC280V, 600W		
Case heater			AC240V, 26W × 3		
Compressor case thermo	US-622KXTMQO-SS		OFF : 125°C, ON : 90°C × 2		

Heat Pump Model

Model MMY-	MAP0501HT7	MAP0601HT7	MAP0801HT7	MAP1001HT7	MAP1201HT7
Compressor	DA351A3FB-22M	Output: : 3.0kW × 2	DA421A3FB-22M	Output: : 3.7kW × 2	
4-way valve coil	VHV	AC200V 50/60Hz	LB64	AC200V 50/60Hz	
Pulse motor valve coil	HAM-MD12TF-3	DC12V			
2-way valve coil	VPV	AC200V 50/60Hz	SV2, SV3D, SV42, SV3A, SV3B, SV3C, SV3E, SV41, SV5		
2-way valve	VPV-122DQ1		SV2, SV3C, SV3D, SV3E		
	VPV-303DQ1		SV3A, SV41, SV42, SV5		
	VPV-603DQ2		SV3B		
High-pressure SW	SCB-JB215		OFF : 3.73MPa, ON : 2.9MPa		
Pressure sensor (For high pressure)	150XA4-H3		0.5 to 3.5V / 0 to 0.98MPa		
Pressure sensor (For low pressure)	150XA4-L1		0.5 to 4.3V / 0 to 3.73MPa		
Fan motor	MF-230-600-2		DC280V, 600W		
Case heater			AC200V, 26W × 3		
Compressor case thermo	US-622KXTMQO-SS		OFF : 125°C, ON : 90°C × 2		

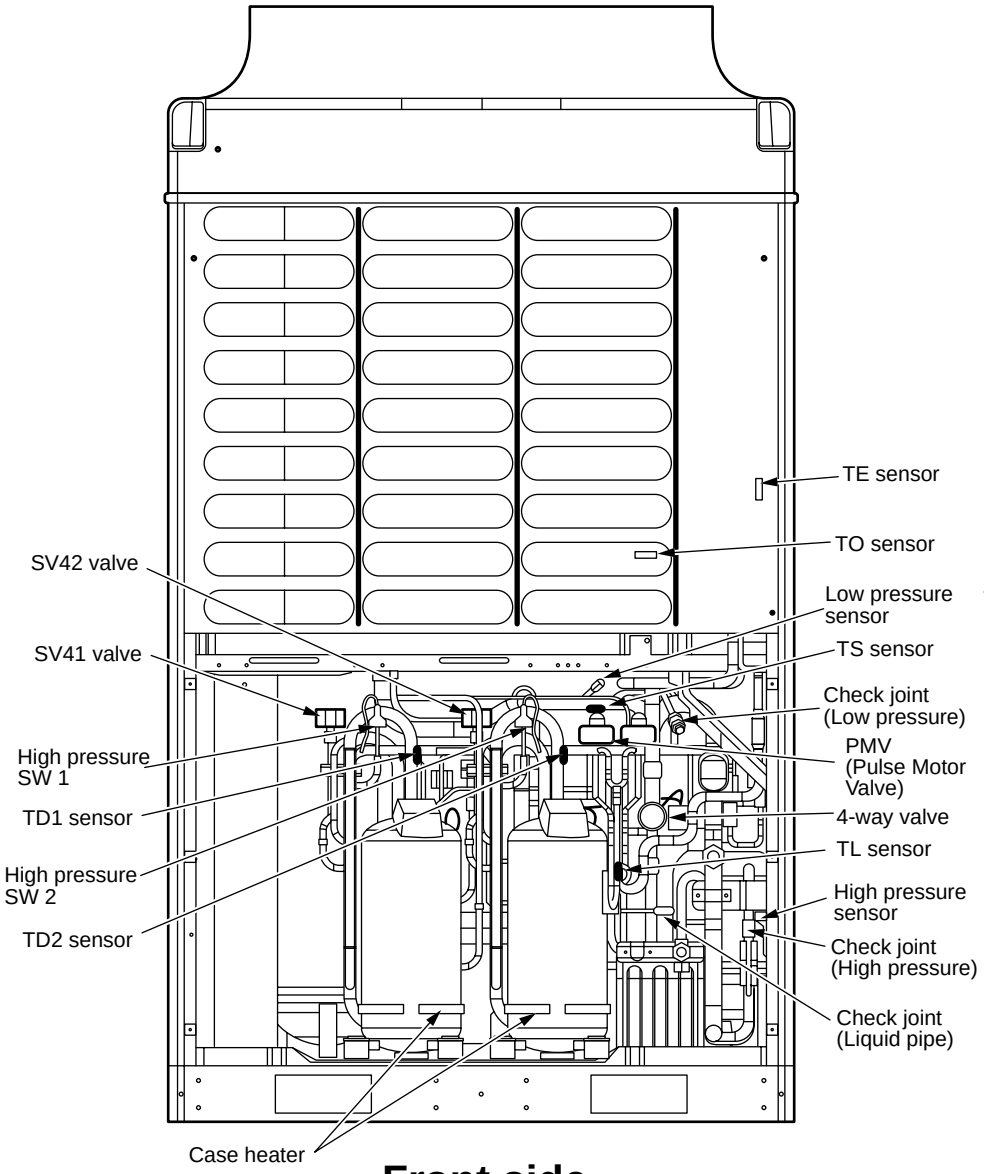
3-3. Outdoor Inverter

Cooling Only Model

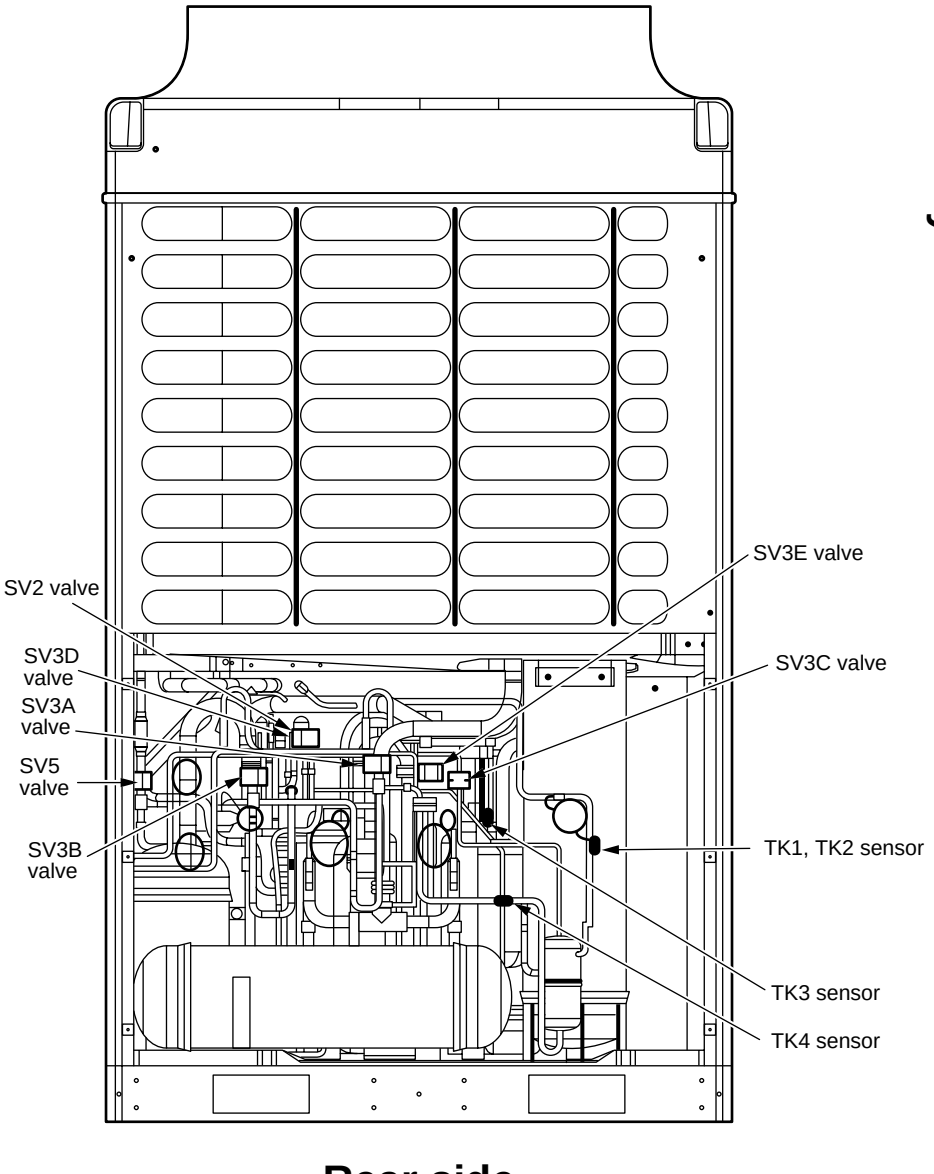
Model MMY-	MAP0501*T8	MAP0601*T8	MAP0801*T8	MAP1001*T8	MAP1201*T8
Power supply terminal block	JXO-3004		AC600V / 30A, 4P		
Communication line terminal block	JXO-B2H		AC30V (or DC42V) / 1A, 6P		
Reactor	CH-44		1.45mH / 25A		
Smoothing condenser (For compressor)	400LRSN 1500M		1500µF / 400V		
Power supply transformer	TT-01-03T		AC230V, 350mA		
P.C. board (Noise filter)			MCC-1366		
Line filter (AC)	FKX-240NK-4810US		0.48mH / 30A (MCC-1366 P.C. board)		
	FKX-220NK-6310US		0.63mH / 25A (MCC-1366 P.C. board)		
P.C. board (Control board)			MCC-1429		
P.C. board	IPDU-4T62DA1E		6.2kW MCC-1502		
P.C. board (Power supply board)			MCC-1439		
P.C. board (IPDU for fan)	IPDU-2D16DA1		800W MCC-896, MCC-897		
Power complex module	6MBR25UA120		25A/1200V (MCC-1502 P.C. board)		
Pipe temp. sensor (TD)	—		–30°C to 135°C (Ambient temp. range)		
Pipe temp. sensor (TS)	—		–20°C to 80°C (Ambient temp. range)		
Heat exchanger temp. sensor (TE)	—		–20°C to 80°C (Ambient temp. range)		
Outside temp. sensor (TO)	—		–20°C to 80°C (Ambient temp. range)		
Oil temp. sensor (TK)	—		–30°C to 135°C (Ambient temp. range)		
Liquid temp. sensor (TL)	—		–20°C to 80°C (Ambient temp. range)		
Smoothing condenser (For fan)	400LRSN1000M		1000µF / 400V		
Magnet SW	FC-2S		400V / 38A		
Thermistor	ZPROYCE101A500		100Ω, 13A, 500V		

Heat Pump Model

Model MMY-	MAP0501HT7	MAP0601HT7	MAP0801HT7	MAP1001HT7	MAP1201HT7
Power supply terminal block	JXO-3004		AC600V / 30A, 4P		
Communication line terminal block	JXO-B2H		AC30V (or DC42V) / 1A, 6P		
Reactor	CH-44		1.45mH / 25A		
Smoothing condenser (For compressor)	400LRSN 1500M		1500µF / 400V		
Power supply transformer	TT-01-03T		AC230V, 350mA		
P.C. board (Noise filter)			MCC-1366		
Line filter (AC)	FKX-240NK-4810US		0.48mH / 30A (MCC-1366 P.C. board)		
	FKX-220NK-6310US		0.63mH / 25A (MCC-1366 P.C. board)		
P.C. board (Control board)			MCC-1429		
P.C. board	IPDU-4T62DA1E		6.2kW MCC-1502		
P.C. board (Power supply board)			MCC-1439		
P.C. board (IPDU for fan)	IPDU-2D16DA1		800W MCC-896, MCC-897		
Power complex module	6MBR25UA120		25A/1200V (MCC-1502 P.C. board)		
Pipe temp. sensor (TD)	—		–30°C to 135°C (Ambient temp. range)		
Pipe temp. sensor (TS)	—		–20°C to 80°C (Ambient temp. range)		
Heat exchanger temp. sensor (TE)	—		–20°C to 80°C (Ambient temp. range)		
Outside temp. sensor (TO)	—		–20°C to 80°C (Ambient temp. range)		
Oil temp. sensor (TK)	—		–30°C to 135°C (Ambient temp. range)		
Liquid temp. sensor (TL)	—		–20°C to 80°C (Ambient temp. range)		
Smoothing condenser (For fan)	400LRSN1000M		1000µF / 400V		
Magnet SW	FC-2S		400V / 38A		
Thermistor	ZPROYCE101A500		100Ω, 13A, 500V		



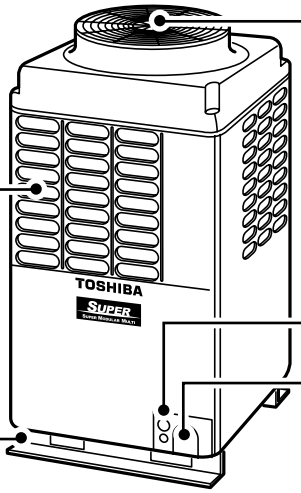
Front side



Rear side

3-5. Name of Each Part

3-5-1. Outdoor Unit



Air outlet (Discharge)
Hot air is discharged when cooling operation is performed.

Cold air is diacharged when heating operation is performed.

Air inlet
They are provided at front, rear, left, and right sides.

Power source hole

Refrigerant pipe connecting hole
Connecting valve is included inside here.

Fixing leg

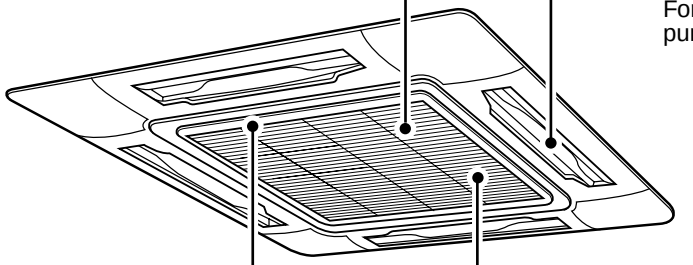
3-5-2. Indoor Unit

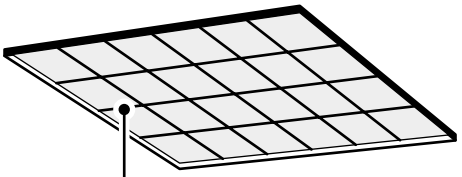
[4-way Air Discharge Cassette Type]

Air outlet/Air outlet flap
Select air blow direction in cooling or heating operation each.

Earth screw
It is included in the electric parts box.

2-way discharge/3-way discharge
2-way discharge or 3-way discharge can be selected according to the shape or arrangement of the room. For details, consult with the dealer which you have purchased the air conditioner.





Air filter
Removes dust and trash.
(Air filter is provided in the air grille.)

Clip
The clip is to open/close the air inlet grille.

Air inlet grille
Air in the room is sucked from here.

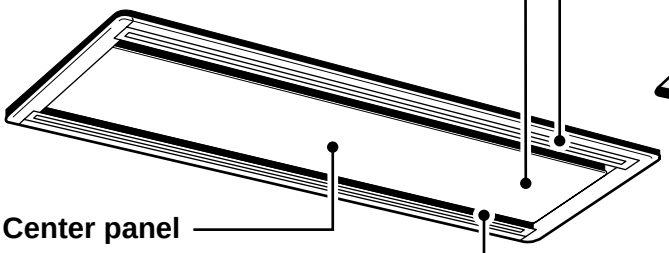
[2-way Air Discharge Cassette Type]

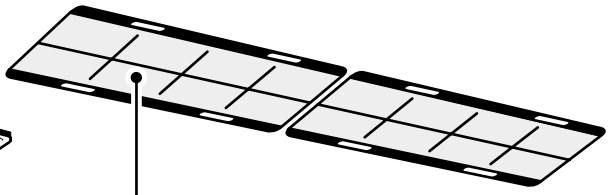
Air outlet/Air outlet flap
Select air blow direction in cooling or heating operation each.

Earth screw
It is included in the electric parts box.



Wiress remote controller
(Sold separately)





Center panel

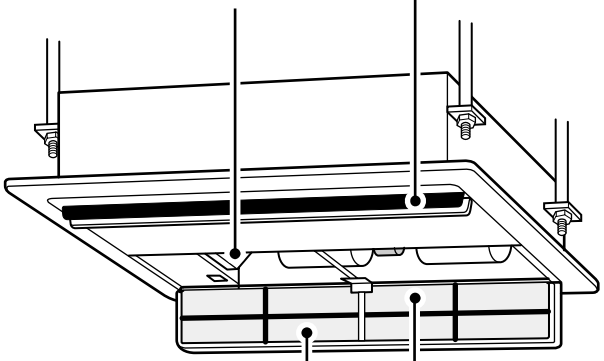
Air inlet
Air in the room is sucked from here.

Air filter
Removes dust and trash.
(Air filter is provided in the center panel.)

[1-way Air Discharge Cassette Type]

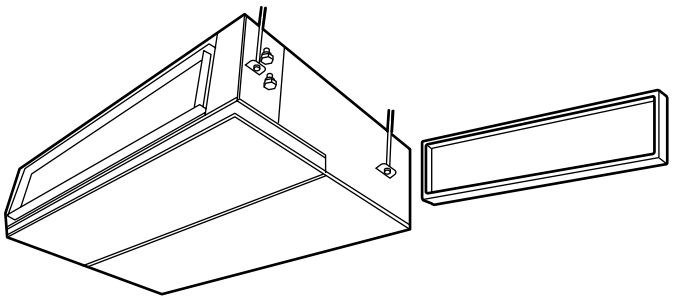
Air outlet/Air outlet flap
Select air blow direction in
cooling or heating operation each.

Earth screw
It is included in the electric parts box.



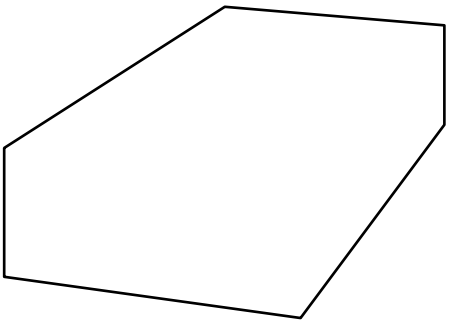
Air inlet grille
Air in the room is sucked from here.

Air filter
Removes dust and trash.
(Air filter is provided in the air inlet grille.)



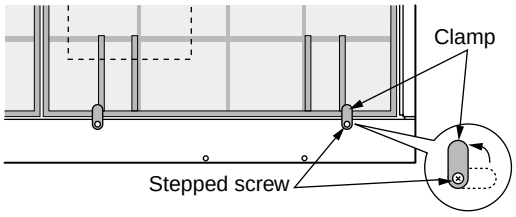
Air inlet
Suction duct is connected.

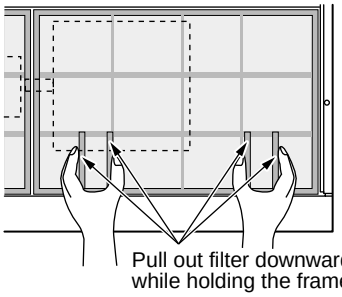
Air outlet
Discharge duct is connected.



[Concealed Duct Standard Type]

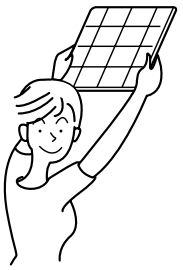
- Slide [Click] of the suction panel toward arrow direction and then open the panel downward. Turn the lever at the bottom side of the main unit to take out the air filter.





[Concealed Duct High Static Pressure Type]

- Cleaning method differs according to the mounted air filter type.
  For cleaning method, please contact the dealer.
- The cleaning method differs depending on the type of attached air filter.
  Please ask the constructor or the dealer which you purchased the air conditioner.



<Before cooling season>

Cleaning of drain pan

- For cleaning of the drain pan, contact the dealer. (If the drain pan or drain port is clogged with dust, water is disabled to drain. In some cases, water overflows from the drain pan and it may wet wall or floor. Be sure to clean the drain pan before the cooling season.)

[Under Ceiling Type]

1 Open the suction grille.

- Hold “knob” of the inlet grille, push it rearward (OPEN), and then open the inlet grille quietly while holding it.

2 Take out the air filter.

- Push knobs of the air filter to remove the claws of the inlet grille. Remove the air filter by pulling it toward you.

3 Suck dust by a vacuum cleaner or clean with water.

- When dirt is heavy, it is effective to clean the filter with tepid water with dissolved neutral detergent or cold water.
- After cleaning the filter with water, dry the filter completely in the shade.

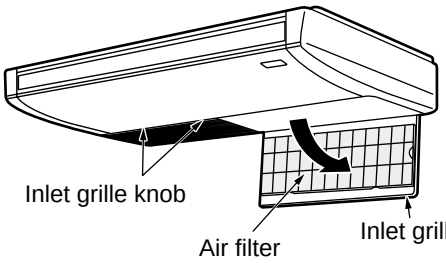
4 Mount the air filter.

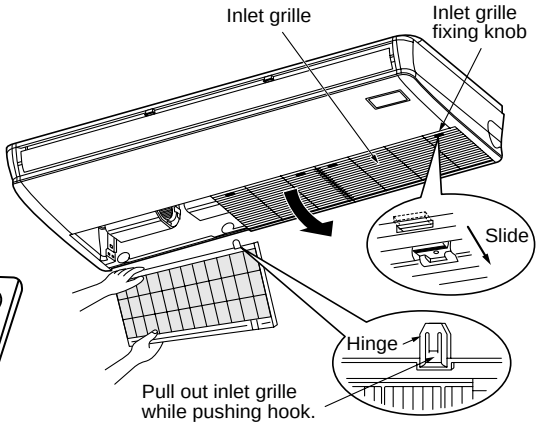
5 Close the inlet grille.

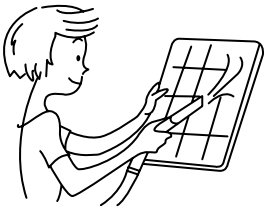
- Close the inlet grille, slide the “knob” toward you, and then fix it surely.

6 Push (▦) **.**

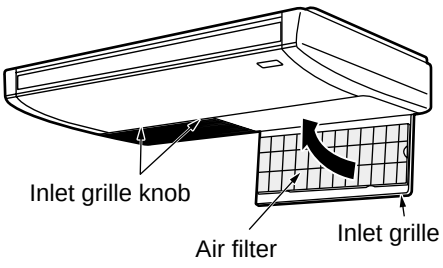
- (▦) display disappears.











[High Wall Type]

<Air inlet grille>

Wipe it with a dried soft cloth.

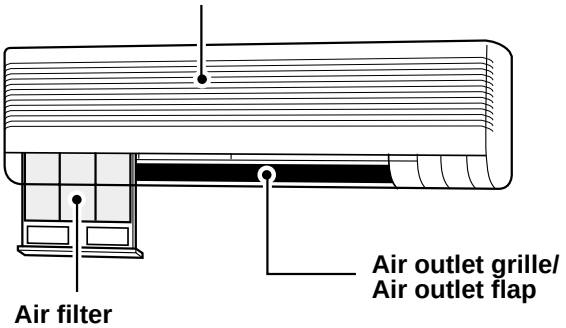
- If dirt of the main unit is not cleaned even if wiped with a dried soft cloth, wipe it completely squeezed cloth which was rinsed with tepid water below 40°C.

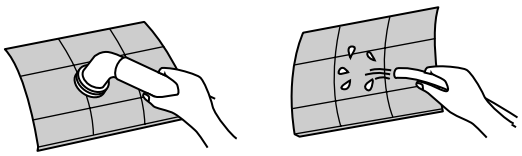
<Air outlet grille/Air outlet flap>

- If using a metal brush or hard sponge for maintenance of the front panel, the surface is scratched and coating of the front panel may be pealed.
- Use neutral detergent for kitchen to clean a heavy dirt and then rinse the grille or flap with water.

Suck dust by a vacuum cleaner or clean with water.

- After cleaning the filter with water, dry the filter completely in the shade.





Attachment air filter

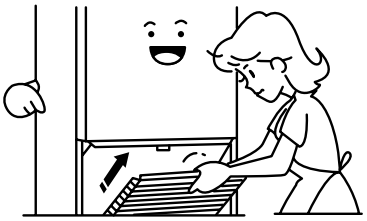
[Floor Standing type]

Cleaning of drain pan

- For cleaning of the drain pan, contact the dealer. (If the drain pan or drain port is clogged with dust, water is disabled to drain. In some cases, water overflows from the drain pan and it may wet wall or floor. Be sure to clean the drain pan before the cooling season.)

<Attachment/detachment of the air filter>

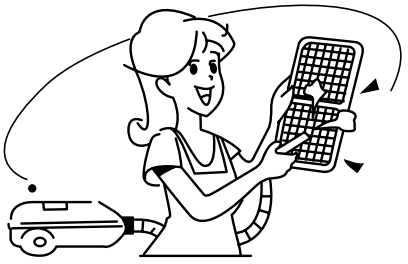
- Pull the air filter downward and take out toward you.



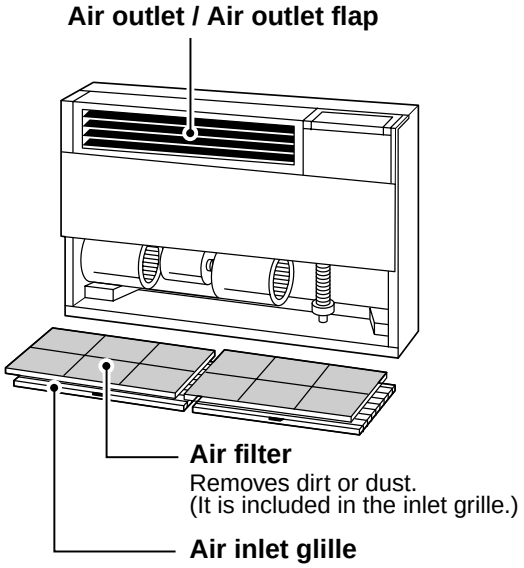
- Insert the air filter into the indoor unit and push in it.

Suck dust by a vacuum cleaner or clean with water.

- When dirt is heavy, it is effective to clean the filter with tepid water with dissolved neutral detergent or cold water.
- After cleaning the filter with water, dry the filter completely in the shade.

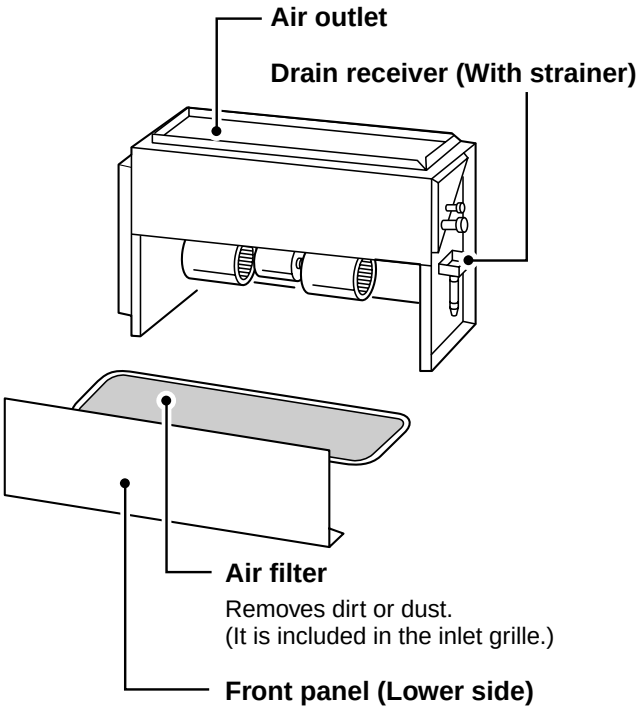


[Floor Standing Cabinet Type]



- Before you clean the air conditioner, be sure to turn off the circuit breaker or the main power switch.
- Clean the air filter every two weeks. If the air filter is clogged with dust, the performance of the air conditioner will deteriorate.

[Floor Standing Concealed Type]



- Clean the drain pan or the drain receiver. If the drain pan or the drain receiver is clogged with dust, water may overflow causing getting wet on the floor.

<How to remove front panel>

- Push down hook of the air filter on the front panel (Lower side)
- Pull the air filter toward you to remove it.

- This model is a concealed type. Therefore conceal other parts than the air outlet and the air filter.
  Be sure not to touch the electric parts box, the surrounding lead wires, the refrigerant pipes, etc. directly with the hands.

Cleaning of the main unit/remote controller

- Wipe them with soft and dry cloth.
- If heavy dirt adheres to the main unit, wipe out it with a cloth dampened with tepid water. For the remote controller, use a dry cloth.

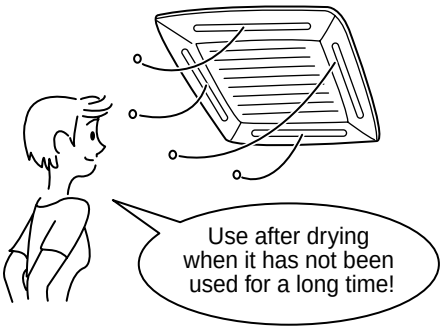


- Do not use benzene, thinner, polishing powder, or similar solvents for cleaning. These may cause a crack or deformation.



<If you do not use the unit for more than 1 month>

- Operate the fan for half a day to dry inside of the main unit sufficiently.
- Turn off the main power switch.
- Clean the air filter and then remount it as before.



<Before cooling season (Concealed Duct High Static Pressure Type)>

Cleaning of drain pan and drain receiver (With strainer)

⚠ CAUTION

Clean the drain pan and the drain receiver (strainer)

If the drain pan or the drain receiver chokes with dust, water overflows or ceiling or floor gets wet.

REQUIREMENT

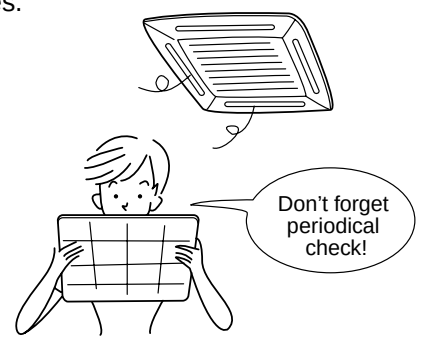
For cleaning of the drain pan or drain receiver, contact the dealer which you purchased the air conditioner.

3-16. How to Use the Air Conditioner Efficiently

To save the charges for electricity and to gain comfortable cooling/heating operation

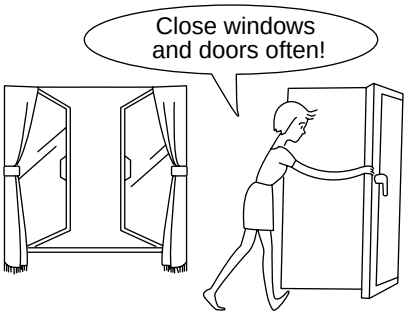
Clean the air filter frequently

- If the air filter is clogged, cooling/heating efficiency decreases.



Close window or door often

- Close window or door often so that cool/hot air does not out of the room.



Do not cool/heat the room excessively

⚠ WARNING

Do not expose your body in cool air for a long time; otherwise it causes worse condition or health loss.

- It is unhealthy; especially take care of children or aged persons.
- Recommended set temperature

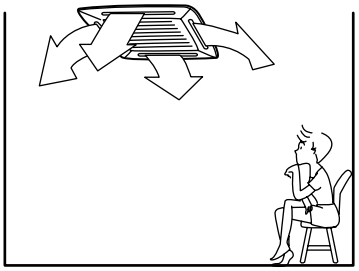
Cool	26 to 28°C
Heat	22 to 24°C



Evenness of room temperature

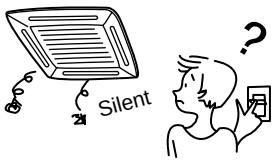
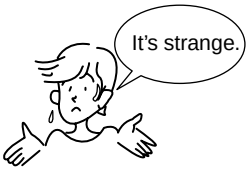
- Using a discharge louver, adjust air direction.

  Exposing yourself for a long time in blowing air exerts a bad influence upon your health.



3-17. When the Following Symptoms are Found

Check the points described below before asking repair servicing.

	Symptom		Cause
Check again.	Outdoor unit	• White misty cold air or water is out. • Sometimes, noise “Pushu !” is heard.	• Fan of the outdoor unit stops automatically and performs defrost operation. • Solenoid valve works when defrost operation starts or finishes.
	Indoor unit	• “Swish” sound is heard sometimes.	• When the operation has started, during the operation, or immediately after the operation has stopped, a sound such as water flows may be heard, and the operation sound may become larger for 2 or 3 minutes immediately after the operation has started. They are flowing sound of refrigerant or draining sound of dehumidifier.
		• Slight “Pishi!” sound is heard.	• This is sound generated when heat exchanger, etc. expand and contract slightly due to change of temperature.
		• Discharge air smells.	• Various smell such as one of wall, carpet, clothes, cigarette, or cosmetics adhere to the air conditioner.
		• The operation lamp flashes	• Flashes when power is turned on again after power failure, or when power switch is turned on.
		• “STANDBY” indication is lit.	• When cooling operation cannot be performed because another indoor unit performs heating operation.
			• When the manager of the air conditioner has fixed the operation to COOL or HEAT, and an operation contrary to the setup operation is performed.
			• When fan operation stopped to prevent discharge of hot air.
		• Sound or cool air is output from the stand by indoor unit.	• Since refrigerant is flowed temporarily to prevent stay of oil or refrigerant in the stand by indoor unit, sound of flowing refrigerant, “Kyururu” or “Shaa” may be heard or white steam when other indoor unit operates in HEAT mode, and cold air in COOL mode may be blow-out.
		• When power of the air conditioner is turned on, “Ticktock” sound is heard.	• Sound is generated when the expansion valve operates when power has been turned on.
It is not a failure.	Operates or stops automatically.		• Is the timer “ON” or “OFF”?
	Does not operate. 		• Is it a power failure? • Is the power switch turned off? • Is the power fuse or breaker blown? • Has the protective device operated? (The operation lamp goes on.) • Is the timer “ON”? (The operation lamp goes on.) • Are COOL and HEAT selected simultaneously? (“STANDBY” indication is lit on the display column of the remote controller.)
	Air is not cooled or warmed sufficiently. 		• Is the suction port or discharge port of the outdoor unit obstructed? • Are any door or window open? • Is the air filter clogged with dust? • Is discharge louver of the indoor unit set at appropriate position? • Is air selection set to “LOW” “MED”, and is the operation mode set to “FAN”? • Is the setup temp. the appropriate temperature? • Are COOL and HEAT selected simultaneously? (“STANDBY” indication is lit on the display column of the remote controller.)

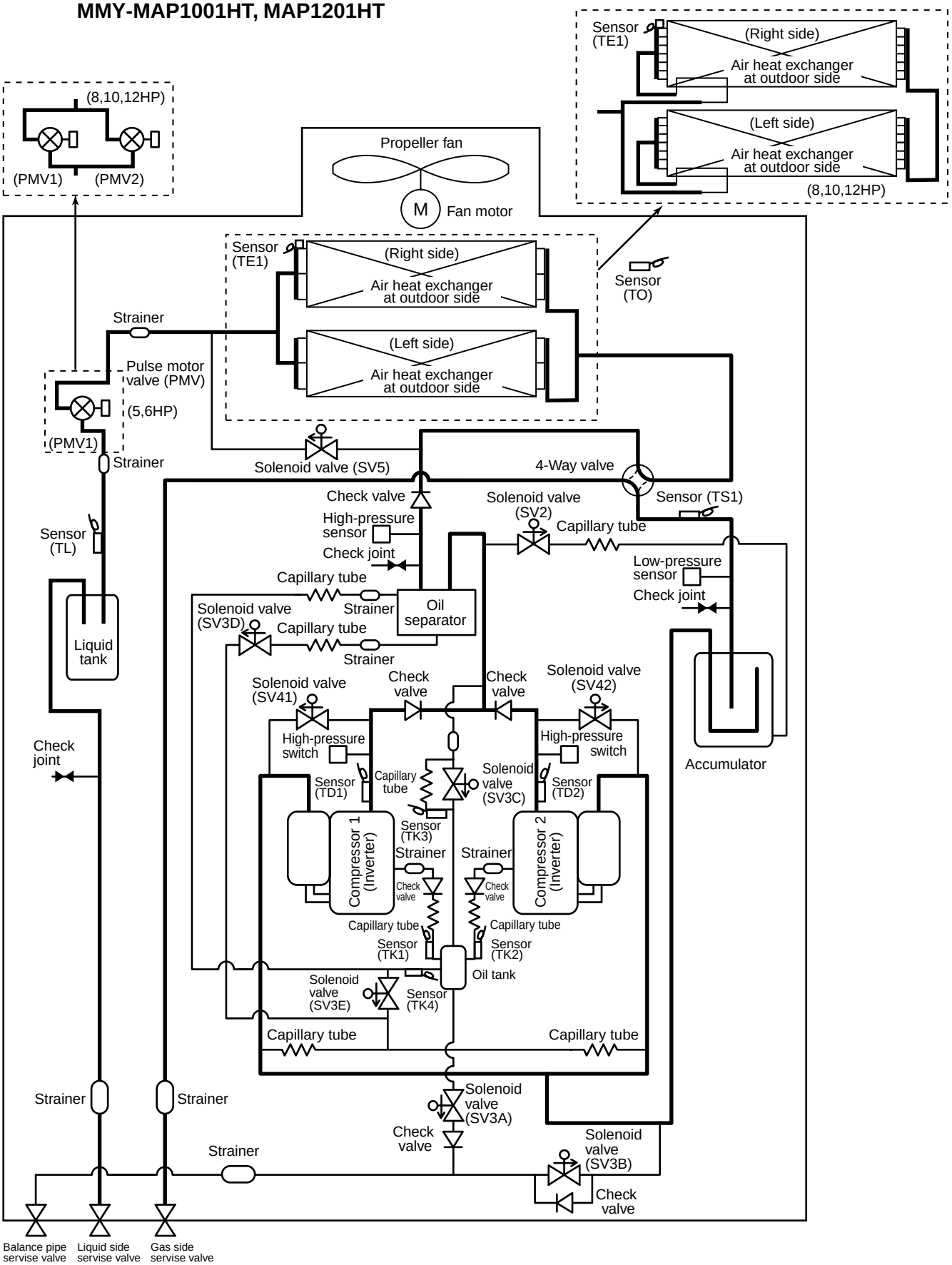
When the following symptoms are found, stop the operation immediately, turn off the power switch, and contact the dealer which you have purchased the air conditioner.

- Activation of switch is unstable.
- Fuse or breaker is blown periodically.
- Foreign matters or water entered by mistake.
- When if activation cause of the protective device has been removed, the operation is not performed.
- Other unusual status occurred.

4. REFRIGERANT PIPING SYSTEMATIC DRAWING

4-1. Inverter Unit (5, 6, 8, 10, 12HP)

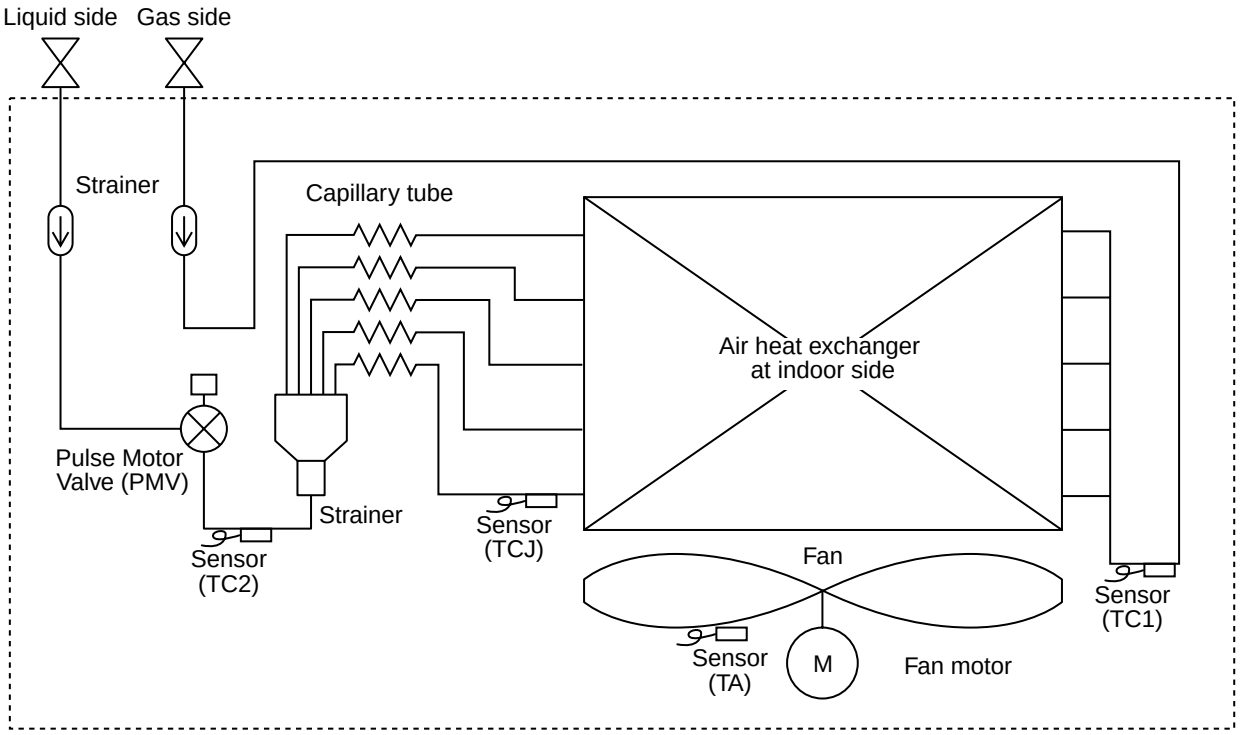
Model: MMY-MAP0501HT, MAP0601HT, MAP0801HT, MMY-MAP1001HT, MAP1201HT



4-2. Explanation of Functional Parts

Functional part name		Functional outline
Solenoid valve	1. SV3A	(Connector CN324: Red) 1) Collects oil in the oil tank during OFF time. 2) Supplies oil reserved in the oil tank during ON time.
	2. SV3B	(Connector CN313: Blue) 1) Returns oil supplied in the balance pipe to the compressor.
	3. SV3C	(Connector CN314: Black) 1) Pressurizes oil reserved in the oil tank during ON time.
	4. SV3D	(Connector CN323: White) 1) Reserves oil in the oil separator during OFF time, and supplies oil during ON time.
	5. SV3E	(Connector CN323: White) 1) Turns on during operation and balances oil between compressors.
	6. SV2	(Hot gas bypass) (Connector CN312: White) 1) Low pressure release function 2) High pressure release function 3) Gas balance function during stop time
	7. SV4 (n)	(Start compensation valve of compressor) (Connector CN311: Blue) 1) For gas balance start 2) High pressure release function 3) Low pressure release function
	8. SV5	(Connector CN310: White) (for Heating model only) 1) Preventive function for high-pressure rising in heating operation
4-way valve		(Connector CN317: Blue) 1) Cooling/heating exchange 2) Reverse defrost
Pulse motor valve	PMV1, 2	(Connector CN300, 301: White) 1) Super heat control function in heating operation 2) Liquid line shut-down function while follower unit stops 3) Sub-cool adjustment function in cooling operation
Oil separator		1) Prevention for rapid decreasing of oil (Decreases oil flowing to the cycle) 2) Reserve function of surplus oil
Temp. sensor	1. TD1 TD2	(TD1: Connector, CN502: White, TD2: Connector, CN503: Pink) 1) Protection of compressor discharge temp. Used for release
	2. TS1	(Connector CN504: White) 1) Controls super heat in heating operation
	3. TE1	(Connector CN505: Green) 1) Controls defrost in heating operation 2) Controls outdoor fan in heating operation
	4. TK1, TK2, TK3, TK4	(TK1 Connector CN514: Black, TK2 Connector CN515: Green, TK3 Connector CN516: Red, TK4 Connector CN523: Yellow) 1) Judges oil level of the compressor
	5. TL	(Connector CN521: White) 1) Detects under cool in cooling operation
	6. TO	(Connector CN507: Yellow) 1) Detects outside temperature
Pressure sensor	1. High pressure sensor	(Connector CN501: Red) 1) Detects high pressure and controls compressor capacity 2) Detects high pressure in cooling operation, and controls the fan in low ambient cooling operation
	2. Low pressure sensor	(Connector CN500: White) 1) Detects low pressure in cooling operation and controls compressor capacity 2) Detects low pressure in heating operation, and controls the super heat
Heater	Compressor case heater	(Compressor 1 Connector CN316: White, Compressor 2 Connector CN315: Blue) 1) Prevents liquid accumulation to compressor
	Accumulator case heater	(Connector CN321: Red) 1) Prevents liquid accumulation to accumulator
Balance pipe		1) Oil balancing in each outdoor unit

4-3. Indoor Unit

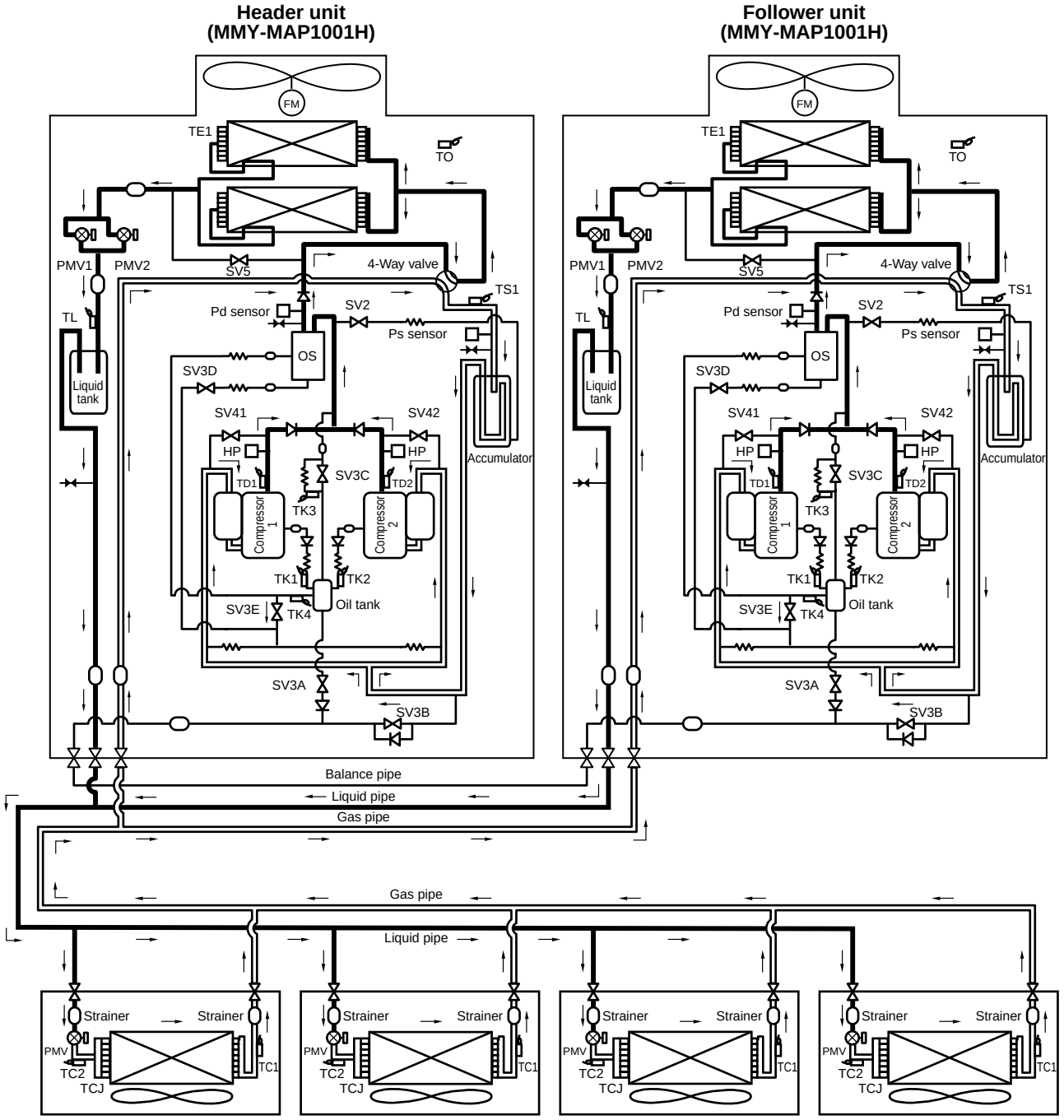


(NOTE) MMU-AP0071YH to AP0121YH type air conditioners have no TC2 sensor.

Functional part name		Functional outline
Pulse Motor Valve	PMV	(Connector CN082 (6P): Blue) 1) Controls super heat in cooling operation 2) Controls under cool in heating operation 3) Recovers refrigerant oil in cooling operation 4) Recovers refrigerant oil in heating operation
Temp. sensor	1. TA	(Connector CN104 (2P): Yellow) 1) Detects indoor suction temperature
	2. TC1	(Connector CN100 (3P): Brown) 1) Controls PMV super heat in cooling operation
	3. TC2	(Connector CN101 (2P): Black) 1) Controls PMV under cool in heating operation
	4. TCJ	(Connector CN102 (2P): Red) 1) Controls PMV super heat in cooling operation 2) [MMU-AP0071 to AP0121YH only] Controls PMV under cool in heating operation

5. COMBINED REFRIGERANT PIPES SYSTEMATIC DRAWING

5-1. Normal Operation (COOL Mode / DEFROST Mode)

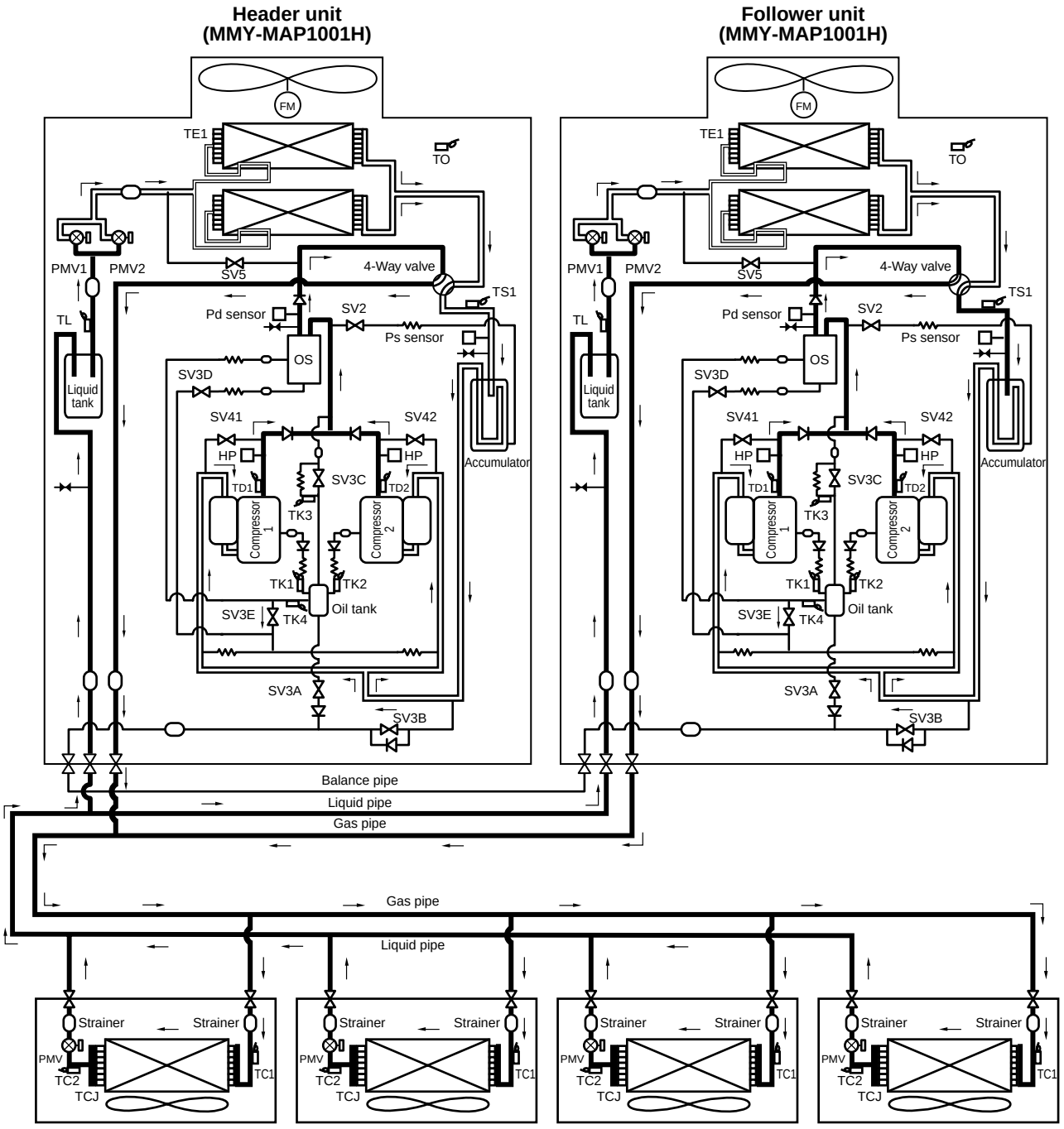


NOTE

An outdoor unit which is connected with indoor/outdoor communication lines is the “Header unit”, and the other unit is called “Follower unit”.

(Example: 20HP system)

5-2. Normal Operation (HEAT Mode)

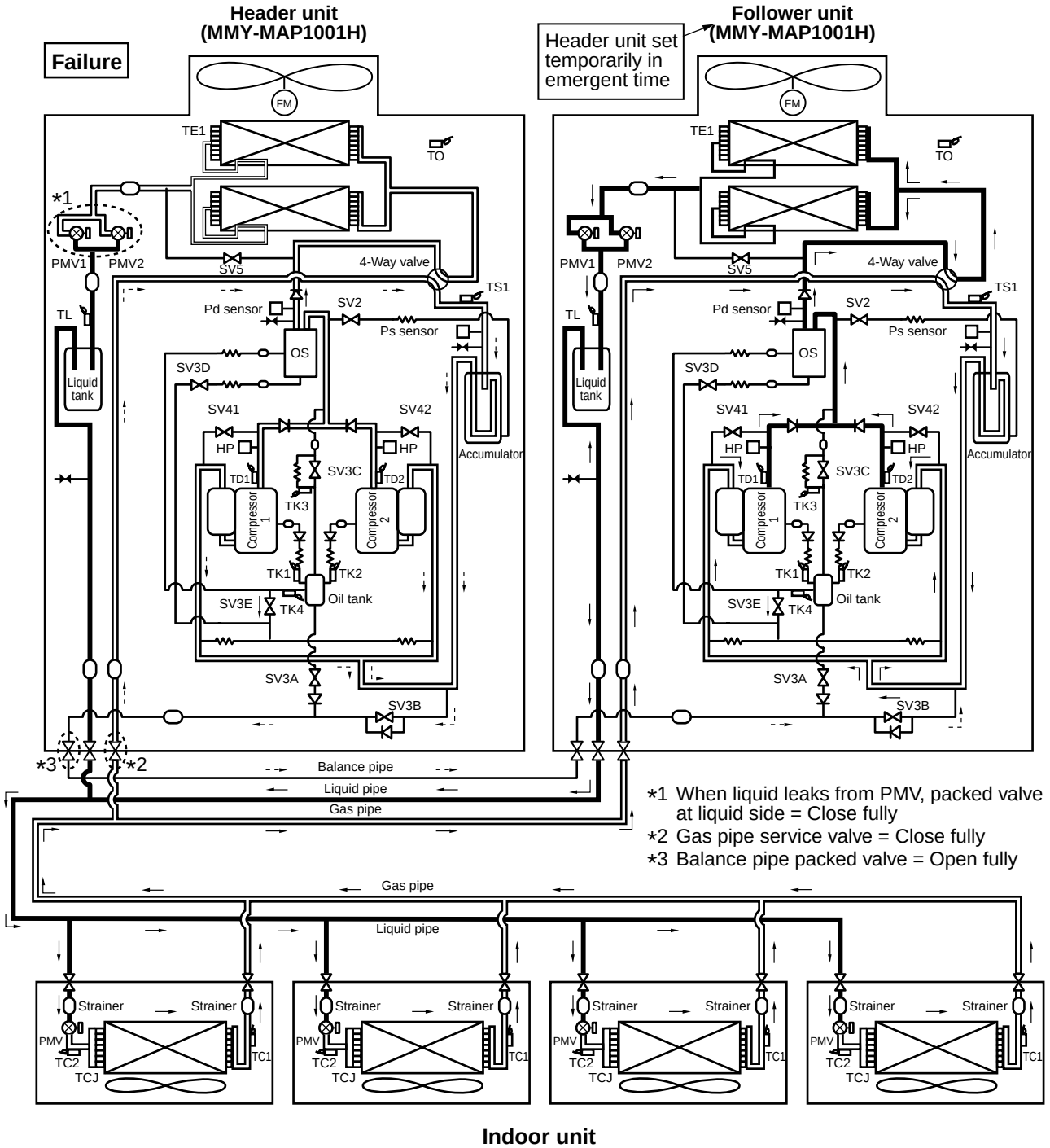


NOTE

An outdoor unit which is connected with indoor/outdoor communication lines is the “Header unit”, and the other unit is called “Follower unit”.

(Example: 20HP system)

5-3. Emergent Operation (Cooling Operation when Center Outdoor Backup)

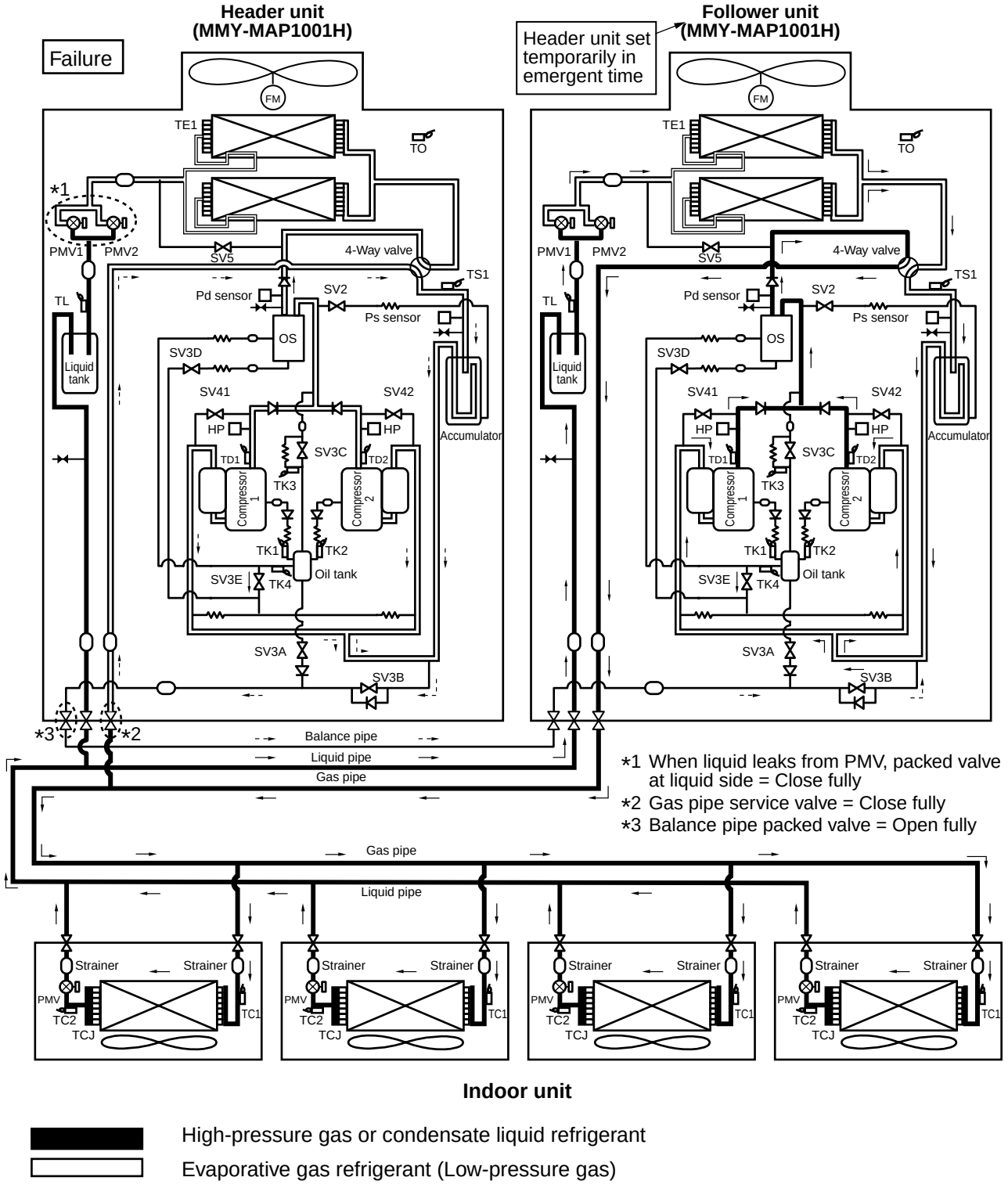


NOTE

An outdoor unit which is connected with indoor/outdoor communication lines is the “Header unit”, and the other unit is called “Follower unit”.

(Example: 20HP system)

5-4. Emergent Operation (Heating Operation when Center Outdoor Backup)

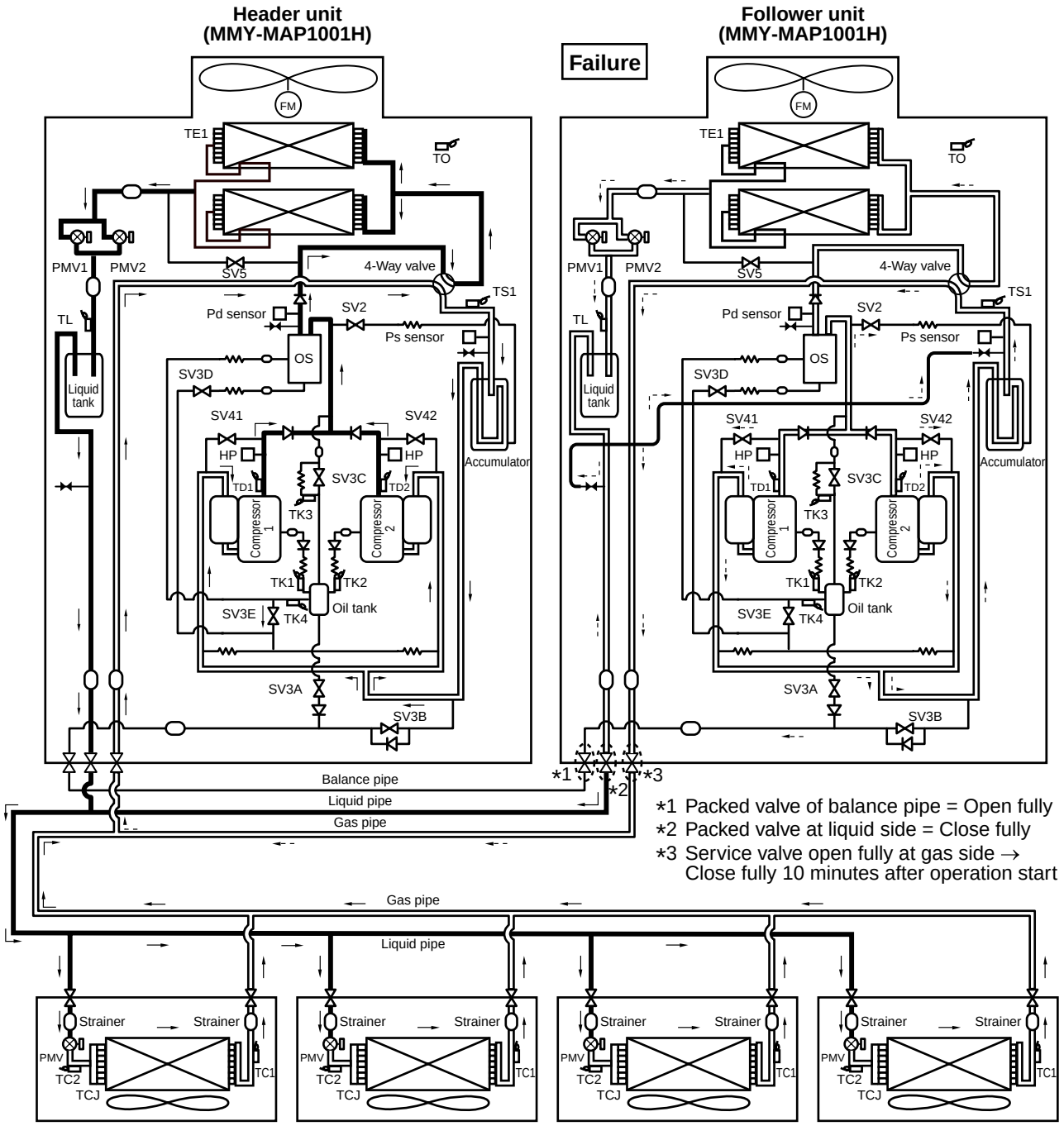


NOTE

An outdoor unit which is connected with indoor/outdoor communication lines is the “Header unit”, and the other unit is called “Follower unit”.

(Example: 20HP system)

5-5. Recovery of Refrigerant in Failed Outdoor Unit (In Case of Failure of Follower Unit)



*1 Packed valve of balance pipe = Open fully
*2 Packed valve at liquid side = Close fully
*3 Service valve open fully at gas side → Close fully 10 minutes after operation start

High-pressure gas or condensate liquid refrigerant

Evaporative gas refrigerant (Low-pressure gas)

NOTE

An outdoor unit which is connected with indoor/outdoor communication lines is the “Header unit”, and the other unit is called “Follower unit”.

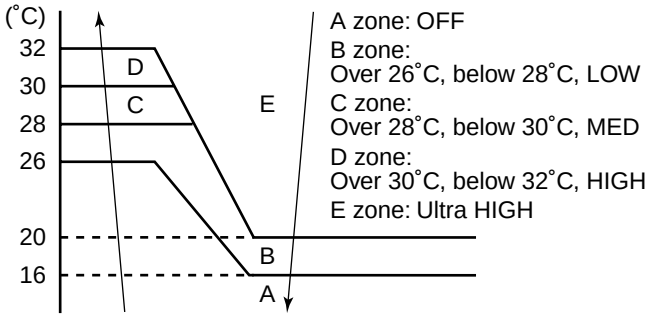
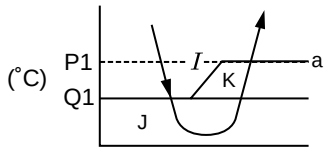
(Example: 20HP system)

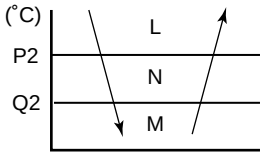
6. CONTROL OUTLINE

6-1. Indoor Unit

6-1-1. Control Specifications

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>1</td><td>Power supply is reset.</td><td>(1) Distinction of outdoor unit
When the power supply is reset, the outdoor units are distinguished, and control is exchanged according to the distinctive results.
(2) Check code clear
When the power supply is reset, the check code is also reset once. If an abnormal status which the check code appears after Start/Stop button of the remote controller has been pushed continues, the check code is displayed again on the remote controller.</td><td></td></tr>
<tr><td>2</td><td>Operation select</td><td>(1) Based upon the operation select command from the remote controller or central controller, the operation mode is selected.
<table><tr><th>Remote controller command</th><th>Control outline</th></tr><tr><td>STOP</td><td>Stops air conditioner.</td></tr><tr><td>FAN</td><td>Fan operation</td></tr><tr><td>COOL</td><td>Cooling operation</td></tr><tr><td>DRY</td><td>Dry operation ∗</td></tr><tr><td>HEAT</td><td>Heating operation</td></tr></table></td><td>∗ Concealed duct type air conditioner cannot operate for drying.</td></tr>
<tr><td>3</td><td>Room temp. control</td><td>(1) Adjustment range Set temperature on remote controller (°C)
<table><tr><th></th><th>In cooling/drying</th><th>In heating</th></tr><tr><td>Wired type</td><td>18 to 29°C</td><td>18 to 29°C</td></tr><tr><td>Wireless type</td><td>18 to 30°C</td><td>16 to 30°C</td></tr></table>(2) From the item code 06, the setup temperature in heating operation can be corrected.
<table><tr><td>Setup data</td><td>0</td><td>2</td><td>4</td><td>6</td></tr><tr><td>Setup temp. correction</td><td>+0°C</td><td>+2°C</td><td>+4°C</td><td>+6°C</td></tr></table>Setup at shipment
<table><tr><td>Setup data</td><td>2</td></tr></table></td><td>Heating suction temperature shift</td></tr>
<tr><td>4</td><td>Automatic capacity control</td><td>(1) Based upon difference between Ta and Ts, the operation frequency is indicated to the outdoor unit.</td><td></td></tr>
<tr><td>5</td><td>Air volume control</td><td>(1) By the command from the remote controller, “HIGH (HH)”, “MED (H)”, or “LOW (L)” “AUTO” operation is executed.
(2) While air speed is in AUTO mode, the air speed is changed according to the difference between Ta and Ts.</td><td>HH > H+ > H > L+ > L > LL</td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>6</td><td>Prevention of cold air discharge</td><td>(1) In heating operation, the upper limit of the fan tap is set by one with higher temperature of TC2 sensor and TCJ sensor.
• When B zone has continued for 6 minutes, the operation shifts to C zone.
• In defrost time, the control point is set to +6°C.
 
</td><td>• In D and E zones, priority is given to remote controller air speed setup.
• In A and B zones, “❁” is displayed.</td></tr>
<tr><td>7</td><td>Freeze prevention control (Low temp. release)</td><td>(1) In cooling operation, the air conditioner operates as described below based upon temp. detected by TC1, TC2 and TCJ sensors.
To prevent the heat exchanger from freezing, the operation stops.
• When “J” zone is detected for 5 minutes, the command frequency becomes “S0” to the outdoor unit.
• In “K” zone, the timer count is interrupted, and held.
• When “I” zone is detected, the timer is cleared and the operation returns to the normal operation.
• When the command frequency became S0 with continuation of “J” zone, operation of the the indoor fan in LOW mode until it reaches the “I” zone.
It is reset when the following conditions are satisfied.
Reset conditions
1) TC1 ≥ 12°C and TC2 ≥ 12°C and TCJ ≥ 12°C
2) 20 minutes passed after stop.
 

<table>
<tr><th></th><th>TC1</th><th>TC2, TCJ</th></tr>
<tr><td>P1</td><td>10°C (5°C)</td><td>10°C</td></tr>
<tr><td>Q1</td><td>0°C</td><td>–14°C</td></tr>
</table>
(2) In cooling operation, the air conditioner operates as described below based upon temp. detected by TC2 and TCJ sensors.
• When “M” zone is detected for 45 minutes, the command frequency becomes “S0” to the outdoor unit.
• In “N” zone, the timer count is interrupted and held.
• When shifting to “M” zone again, the timer count restarts and continues.
• If “L” zone is detected, the timer is cleared and the operation returns to normal operation.
Reset conditions
1) TC1 ≥ 12°C and TC2 ≥ 12°C and TCJ ≥ 12°C
2) 20 minutes passed after stop.
 

<table>
<tr><th></th><th>TC2, TCJ</th></tr>
<tr><td>P2</td><td>5°C</td></tr>
<tr><td>Q2</td><td>–2.0°C</td></tr>
</table></td><td>∗ In a Model without TC2, TC2 is not judged.</td></tr>
</table>

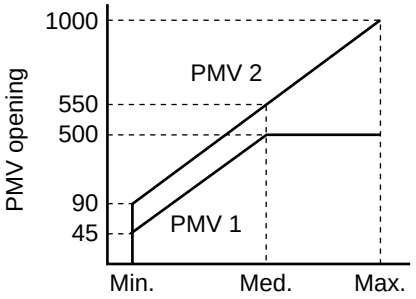
No.	Item	Outline of specifications	Remarks
8	Recovery control for cooling refrigerant and oil	1) The indoor unit which stops operation, thermostat is OFF, or operates in FAN mode opens PMV of the indoor unit by the specified opening degree when cooling refrigerant or oil recovery signal receive from the outdoor unit. 2) Drain pump of 4-way air discharge cassette type and concealed duct type operate during recovery control mode.	• Recovery operation is usually executed every 2 hours.
9	Recovery control for heating refrigerant and oil	The indoor unit which stops operation, thermostat is OFF, or operates in FAN mode performs the following controls when the heating refrigerant/Oil recovery signal is received from the outdoor unit. 1) Opens PMV of the indoor unit by the specified opening degree. 2) Stops the fan. 3) Only 4-way Air Discharge Cassette type air conditioner rotates the indoor fan with intermittent operation for approx. 1 minute after recovery control. 4) Only 4-way Air Discharge Cassette type air conditioner rotates the indoor fan with intermittent operation for approx. 1 minute after recovery control as the outdoor unit. 5) After recovery control, drain pump of 4-way air discharge cassette type and concealed duct type will operate.	• In the indoor unit which thermostat is OFF, or operates in FAN mode, "⏻" lamp goes on. • Recovery operation is usually executed every 1 hour.
10	Short intermittent operation compensation control	(1) For 5 minutes after the operation has started, the operation is continued even if entering thermostat-OFF condition. (2) However, if the thermostat has been turned off by changing the set up temp., the thermostat is OFF with even the above condition. The protective control has priority.	
11	Drain pump control	(1) During "COOL" operation (including DRY operation), the drain pump operates. (2) While the drain pump operates, if the float switch works, the drain pump continues operation and a check code is displayed. (3) While the drain pump stops, if the float switch works, turn off the capacity demand command, stop the operation, and operate the drain pump. If the float switch continues operating for approx. 5 minutes, the operation stops and the check code is displayed. (4) In heating operation, if humidifier "provided" is judged, compressor "ON", fan "ON", and MAX (TC2, TCJ) ≥ 33°C, the drain pump operates.	Check code [P10] When CN70 is connected or the item code 40 setup data is 1, the setup becomes humidifier "provided", and the drain pump operates with the left conditions.
12	Elimination of remaining heat	(1) When the air conditioner stops in the "HEAT" mode, drive the indoor fan with "LOW" mode for approx. 30 seconds.	
13	Auto flap control	(1) When the louver signal has been received from the remote controller, the louver operates if the indoor fan is operating. (2) In 4-way Air Discharge Cassette type, the discharge louver automatically directs downward if the operation stops. (3) In 4-way Air Discharge Cassette type, the discharge louver directs upward if the heating operation is being prepared.	
14	Filter sign display (None in wireless type) * Provided in the separately laid type TCB-AX21E.	(1) The operation time of the indoor fan is integrated and stored in memory, and the filter exchange signal is sent to the remote controller to display on the remote controller LCD after the specified time. (2500H) (2) When the filter reset signal is received form the remote controller, time of the integrated timer is cleared. In this time, if the specified time has passed, the measured time is reset and LCD display disappears.	

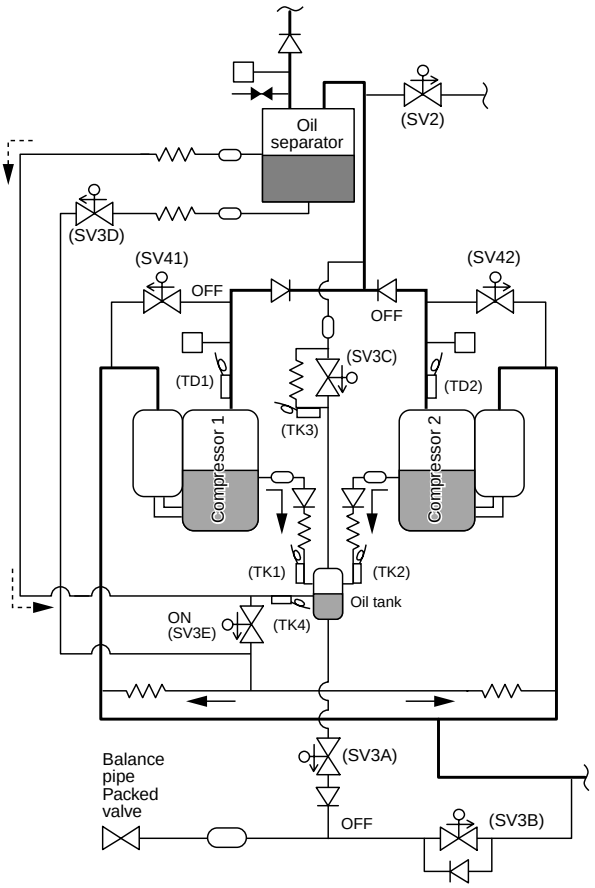
No.	Item	Outline of specifications	Remarks
15	"⏻" and "❁" display (Operation and heating stand-by)	**<Operation standby> .....** Display on remote controller (1) • "P05" is one of displays of power wire missingand when it's detected. • "COOL/DRY" operation cannot be performed because the other indoor unit is under "HEAT" operation. • "HEAT" operation cannot be performed because COOL priority is set (Outdoor I/F P.C. board SW11 1-bit is ON) and the other indoor unit is under "COOL/DRY" operation. • "FAN" operation cannot be performed because the system performs "Heat oil/Refrigerant recovery" operation. • There is a unit in which indoor overflow "P10" is detected. • There is a unit in which interlock alarm "P23" is detected. (2) The above indoor units unavailable to operate waits under condition of thermostat OFF. **<HEAT standby> .....** Display on remote controller (1) • HEAT thermostat is OFF. • During HEAT operation, the fan rotates with lower air speed than one specified in order to prevent discharge of cold draft or stops. (including case that defrost operation is being performed) • "HEAT" operation cannot be performed because COOL priority is set (Outdoor I/F P.C. board SW11 bit 1 is ON) and the other indoor unit is under "COOL/DRY" operation. (2) "HEAT standby" is displayed until the above conditions are released.	• "⏻" goes on. • "❁" goes on.
16	Selection of central control mode	(1) The contents which can be changed on the remote controller at indoor unit side can be selected by setup at the central controller side. (2) In case of operation from TCC-LINK central controller (TCB-SC642TLE, etc.) **[Central control mode 1]** : Cannot operate **[Central control mode 2]** : Cannot operate, stop, select mode, set up temp. **[Central control mode 3]** : Cannot select mode, set up temp. **[Central control mode 4]** : Cannot select mode (3) RBC-AMT21E (Wired remote controller) While mode is the central control mode, "CENTRAL" lights on the display part of the remote controller. **[After command priority]** Both remote controller at indoor unit side and central controller are available to set up the operation mode, and the unit operate by the newest command. **[Center]** The remote controller at indoor unit side can operate only ON or OFF. **[Access inhibit]** The remote controller at indoor unit can't operate.	If operation is performed from the remote control "CENTRAL CONTROL" mode, the status is notified with receiving sound.

6-2. Outdoor Unit

6-2-1. Operation Start/Operation End

The compressor, solenoid valve, pulse motor valve (PMV), outdoor fan, etc. are controlled by a command from the indoor controller. The follower outdoor unit starts/stops by a command from the header outdoor unit.

No.	Item	Operation explanation and applied data, etc.	Remarks
1	Pulse Motor Valve (PMV) control	(1) PMV control (using two PMV, 1 and 2) 1) PMV (Pulse Motor Valve) is controlled between 90 to 1000 pulses during operation. 2) In cooling operation, PMV opening is controlled based upon detected TL sensor temp. and detected Pd pressure value. (Under-Cool control) 3) In heating operation, PMV opening is controlled based upon detected TS and TD sensor temp. and detected PS pressure value. (Super-Heat control) 4) Close fully PMV opening when thermostat is OFF, operation stops and A.C. stops in trouble. 	• In heating operation, PMV2 is 0 pulses and PMV may be controlled by PMV1 only with the minimum 45 pulses.
2	Outdoor fan control	(1) Cooling fan control 1) Outdoor fan speed (mode) is controlled based upon detected Pd pressure value. 2) In a specified time when cooling operation started, the center outdoor unit controls the outdoor fan speed based upon detected Pd pressure value. The follower outdoor unit controls the outdoor fan speed (mode) based upon detected TE sensor temp. (2) Heating fan control 1) Outdoor fan speed (mode) is controlled based upon detected TE sensor temp. 2) If TE > 25°C has been continuously detected for 5 minutes, the operation may stop. In this case, the status is same as one in usual thermostat-OFF, so the operation restarts. 3) After A.C started, this control is not performed during the specified time after defrost operation and defrost control. 4) When refrigerant is excessively shortened, START/STOP operation may be repeated by this control. (3) Control for follower unit stop The fan is driven with lower limit mode to prevent refrigerant accumulation into the outdoor heat exchanger.	When TE temp. (ambient temperature) exceeds 25°C, Heating operation stops. (Over the operation temp. condition of ambient temp.)

No.	Item	Operation explanation and applied data, etc.	Remarks
3	Capacity control	1) According to the capacity demand command from the indoor controller, the inverter frequency control of the header and follower units is determined. The header unit sets the start order of the follower unit connected to the system and then starts the operation. 2) Two compressors in the outdoor unit rotate every stop of compressor and exchanges the start order when the compressor will be ON in the next time. 3) When two or more follower units are connected, if the system thermostat is OFF, the rotation is judged every compressor-OFF of the follower unit and the start priority order of the follower units in the next start time is exchanged.	• Min. frequency: 26Hz
4	Oil level detection control	1) Based upon the detected temperature of TK1 to TK4 sensors, whether the right amount of oil is included in the compressor case or not is judged. The header unit and follower unit perform this control individually. 2) From relation between the detected temperature of the operating compressor TK1 or TK2 and detected temperature of TK3, TK4, whether oil level in the compressor case is right or not is judged. If it is insufficient, the control shifts to the oil equation control. 3) This control is usually performed during operation of the compressor. 	• The detection is performed in both cases of operation of a compressor and operation of two compressors.

No.	Item	Operation explanation and applied data, etc.	Remarks
5	Oil equation control	This control is provided to prevent the oil short in the compressor of each outdoor unit. This control is basically performed by ON/OFF operation of the solenoid valves SV3A, SV3B, SV3C, SV3D. (For the schematic diagram of oil equation control.) (1) Normal oil equalizing operation This control is used when the oil level down has been detected for a long time. (2) Oil equation control This control supplies oil accumulated in the oil cylinder of each outdoor unit to the outdoor unit in which oil level moved down. This control is performed during compressor-ON of the header unit when oil level judgment result of the header unit shows "Short" or the oil equation demand is issued from the system of even a header unit. In a case of system with a header unit (No follower unit is connected.), this control is not executed. (3) Oil-short protective control If an oil equation control is executed, the protection stops when the status of oil short continues for 30 minutes, and it restarts after 2 minutes and 30 seconds after. After then, if the protection stop is repeated 3 times, an error is determined. (Restart is not performed.) The error code is "H07".	
6	Refrigerant/Oil recovery control	(1) In cooling operation, this control is executed to regularly recover the refrigerating oil stagnated in gas inter-unit pipe or indoor unit to the outdoor unit when the compressor driving command is weak, and to prevent refrigerant accumulation in the outdoor heat exchanger while low ambient cooling operation is performed. This control is managed by the header outdoor unit. 1) Control conditions • Cooling oil recovery control is executed every 2 hours approximately. 2) Contents of control • Recovery time continues for approx. 2 or 3 minutes though it differs according to the system capacity. (2) Refrigerant recovery control in heating room During heating operation, this is executed to recover liquid refrigerant stagnated in the stopped indoor unit. It is also used to recover oil in the outdoor heat exchanger in heating overload operation except with defrost condition. This control is managed by the header outdoor unit. 1) Heating refrigerant recovery control is executed every an hour approximately. 2) Recovery time continues for approx. 2 to 10 minutes though it differs according to the load condition.	
7	Defrost control (Reverse defrost method)	(1) Defrost start condition In heating operation, the operating time is integrated when the detected TE sensor temp was lower than -2°C, and when 25 minutes have passed in the initial time after the compressor started and 55 minutes in the second time and after. (2) Contents of control • If the outdoor units are combined, the defrost operation forcedly continues for 2 minutes if the defrost operation has been once started. (3) Stop conditions of defrost operation • If the outdoor units are combined, the fan drive and compressor inverter frequency may be controlled by Pd pressure during defrost operation.	• During defrosting operation, all the solenoid valves of 4-way are OFF and all compressors are driven.

No.	Item	Operation explanation and applied data, etc.	Remarks
8	Release valve control	(1) SV2 gas balance control This control is executed to balance the gas when opening SV2 while the compressor is off, in order to decrease the activation load in the next compressor-ON time. This control is individually executed by the header outdoor unit and each follower outdoor unit. (2) SV2 high pressure release control This control is to control pressure rising in low-frequency operation of the inverter. (3) SV2 low pressure release control This control is to prevent quick pressure dropping in transient operation. This control is individually executed by the header outdoor unit. This control is executed as necessary except during stop time and thermostat-OFF time. (4) SV41, 42 low pressure release control This control is to prevent low pressure dropping and is individually executed by the header unit and each follower unit. This control is executed during defrost operation, heating start pattern control operation, and cooling operation. (5) SV5 high pressure release control This control is to prevent high pressure rising and is executed for the header unit only.	
9	Compressor stop by high pressure release control	This control is to forcedly stop the compressor in each outdoor unit according to Pd pressure. It is individually executed by the header unit and each follower unit. (1) Contents of control • The compressor stops when Pd pressure is over 3.5MPa.	
10	Case heater control	The case heater output includes compressor case heater and accumulator case heater. This control is to prevent accumulation of refrigerant in the compressor case by turning of the power of heater while the compressor stops, and it is executed in all the outdoor units. If electricity is not turned on for a specified time before the test run after installation, a trouble of the compressor may be caused. When the power has been interrupted for a long time and the operation starts from the status as it was, it is desirable to turn on the power before start of operation as per the test run time. This control is used often together with the compressor winding heating control. In this case, the power sound may be heard but it is not a trouble. (1) Contents of control • Turns on during compressor-OFF • Turns off when the detected TO sensor temp is 28°C or higher, and turns on when it is 25°C or lower • The operation continues for 10 minutes after compressor-OFF changed to compressor-ON.	
11	IPDU control	IPDU controls the inverter compressor by command frequency, frequency up/down speed, and current release control value from the interface P.C. board. The main controls of IPDU control P.C. board are described below. (1) Current release control The output frequency is controlled by AC input current value which is detected by inputting current sensor (CT) on the control P.C. board to prevent the inverter input current from rising higher than the specified value.	

No.	Item	Operation explanation and applied data, etc.	Remarks
11	IPDU control (Continued)	(2) Heat sink temp detection control 1) This control protects IGBT overheat preventive protection by the thermistor (TH temp) on the compressor driving module in IPDU. ∗ For TH temperature, the higher one of IPDU1 temperature and IPDU2 temperature is applied. (3) Over-current protective control 1) The compressor stops when IPDU control P.C. board detects over-current. (4) Compressor case thermo control 1) When the compressor case thermostat works, the compressor stops. 2) When the compressor stops, 1 is counted to the error count, and the compressor reactivates after 2 minutes and 30 seconds. After reactivated, the error count is cleared if the operation continues for 10 minutes or more. 3) The error is determined with error count 4. The error “H04” is displayed in compressor 1 and “H14” in compressor 2, respectively.	• TH sensor is provided to IPDU1 and 2 each. • The case thermostat is usually closed and connected to the interface P.C. board.
12	High pressure prevention control	(1) High pressure SW control • The high-pressure SW is usually closed and connected to IPDU. 1) The compressor driver stops when high pressure SW at inverter compressor operates. 2) When the compressor driver stops, 1 is counted to the error count, and the compressor driver reactivates after 2 minutes 30 seconds. After reactivated, the error count is cleared if the operation continues for 10 minutes or more. 3) The error is determined with error count 4. The error “P04” is displayed.	

<Other cautions>

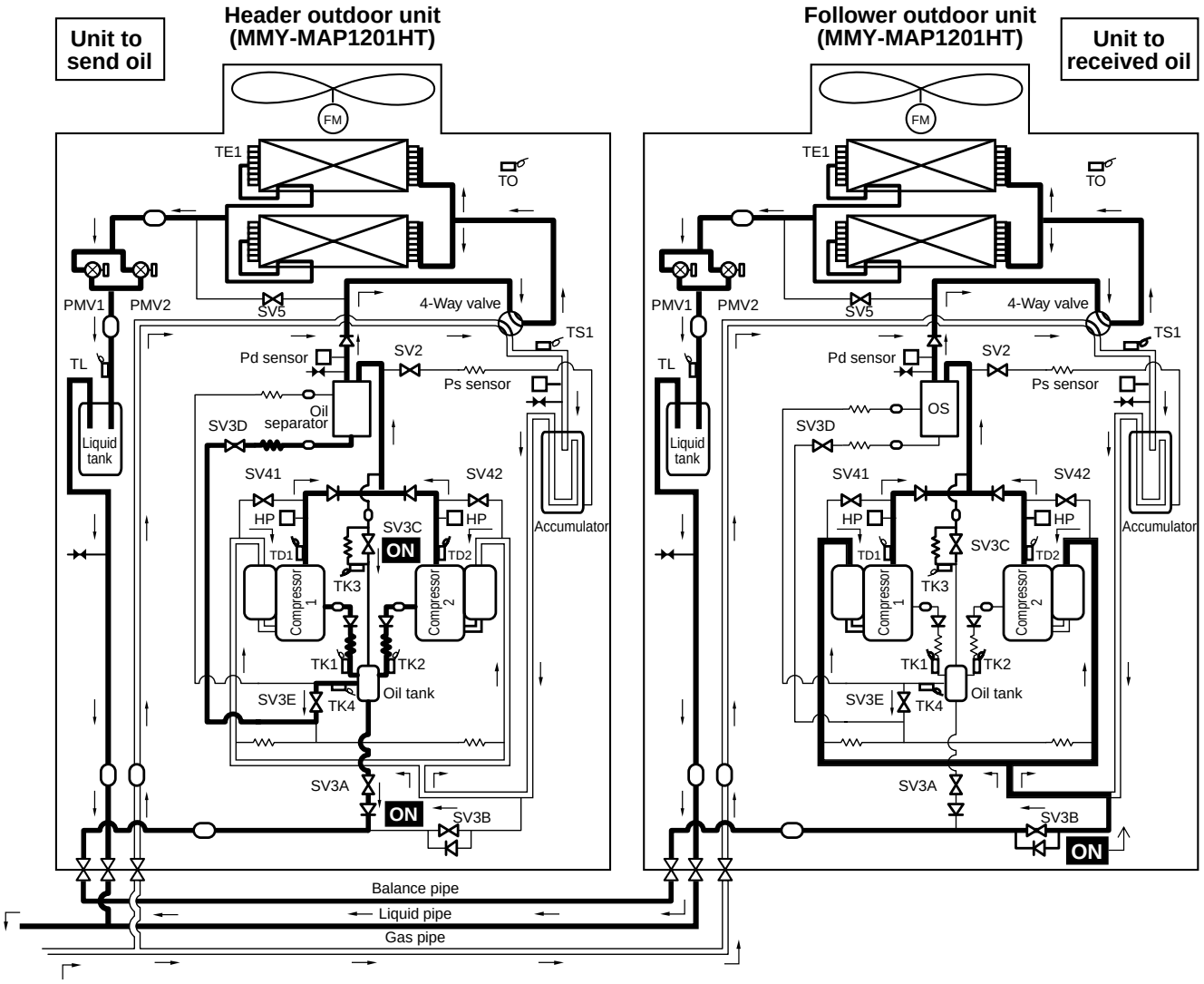
1. Cooling operation in low ambient temperature

1) When low pressure is lowered, the freeze prevention control by the indoor unit TC sensor may decrease the frequency.
2) When low pressure is lowered, the cooling capacity control may decrease the frequency.
3) When discharge temp. sensor value lowers below 60°C, the frequency may be increased over the receive command from the indoor unit.

2. PMV (Pulse Motor Valve) for outdoor unit

1) When the power is turned on, a tap sound to initialize PMV is heard. If this sound is not heard, PMV operation error is considered. However, this sound may not be heard at a place where outside sound takes precidence.
2) Do not remove the driving part (Head part) of PMV during operation. It may cause error in opening.
3) When transporting (replacing) the set, never keep the driving part removed. The valve is closed, and the valve is damaged by sealed liquid compression.
4) When removing the driving part and attaching it again, push in it securely until a “click” sound can be heard. Then, turn off the power once, and turn on the power again.

<Oil equation control schematic diagram>

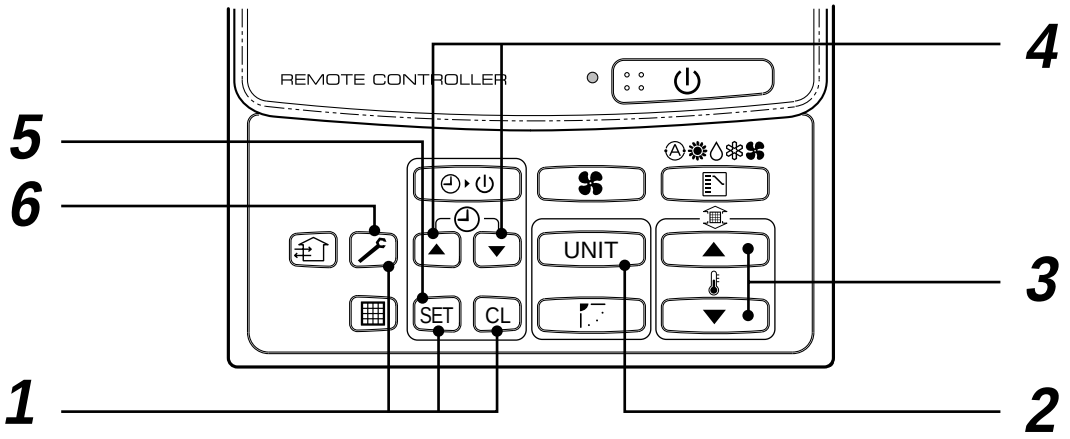


7. APPLIED CONTROL

7-1. Indoor Unit

7-1-1. Setup of Selecting Function in Indoor Unit (Be sure to Execute Setup by a Wired Remote Controller)

<Procedure> Execute the setup operation while the unit stops.



1 **Push [SET], [CL], and [🔧] buttons simultaneously for 4 seconds or more.**
The firstly displayed unit No. indicates the header indoor unit address in the group control.
In this time, the fan of the selected indoor unit is turned on.

2 **Every pushing [UNIT] button, the indoor unit numbers in the group control are successively displayed. In this time, the fan of the selected indoor unit only is turned on.**

3 **Specify the item code (DN) using the setup temperature [▲] and [▼] buttons.**

4 **Select the setup data using the timer time [▲] and [▼] buttons.**
(When selecting the DN code to "33", change the temperature indication of the unit from "°C" to "°F" on the remote controller.)

5 **Push [SET] button. (OK if display goes on.)**
- To change the selected indoor unit, return to procedure ***2***.
- To change the item to be set up, return to procedure ***3***.

6 **Pushing [🔧] button returns the status to normal stop status.**

Table: Function selecting item numbers (DN)
(Items necessary to perform the applied control at the local site are described.)

DN	Item	Description	At shipment
01	Filter sign lighting time	0000 : None 0001 : 150H 0002 : 2500H 0003 : 5000H 0004 : 10000H	According to type
02	Dirty state of filter	0000 : Standard 0001 : High degree of dirt (Half of standard time)	0000 : Standard
03	Central control address	0001 : No.1 unit to 0064 : No.64 unit 0099 : Unfixed	0099 : Unfixed
04	Specific indoor unit priority	0000 : No priority 0001 : Priority	0000 : No priority
06	Heating temp shift	0000 : No shift 0001 : +1°C 0002 : +2°C to 0010 : +10°C (Up to +6 recommended)	0002 : +2°C (Floor type 0000: 0°C)
0d	Existence of automatic cool/heat mode	0000 : Provided 0001 : Not provided (Automatic selection from connected outdoor unit)	0001 : Not provided
0F	Cooling only	0000 : Heat pump 0001 : Cooling only (No display of [AUTO] [HEAT])	0000 : Heat pump
10	Type	0000 : (1-way air discharge cassette) 0001 : (4-way air discharge cassette) to 0037	According to model type
11	Indoor unit capacity	0000 : Unfixed 0001 to 0034	According to capacity type
12	Line address	0001 : No.1 unit to 0030 : No.30 unit	0099 : Unfixed
13	Indoor unit address	0001 : No.1 unit to 0064 : No.64 unit	0099 : Unfixed
14	Group address	0000 : Individual 0001 : Header unit of group 0002 : Follower unit of group	0099 : Unfixed
19	Flap type (Adjustment of air direction)	0000 : Not provided 0001 : Swing only 0004 : [4-way Air Discharge Cassette type] and [Under Ceiling type]	According to type
1E	Temp difference of automatic cooling/ heating mode selection COOL → HEAT, HEAT →COOL	0000 : 0 deg to 0010 : 10 deg (For setup temperature, reversal of COOL/HEAT by ± (Data value)/2)	0003 : 3 deg (Ts±1.5)
28	Automatic restart of power failure	0000 : None 0001 : Reset	0000 : None
29	Operation condition of humidifier	0000 : Usual 0001 : Condition ignored (Detection control for heat exchanger temperature)	0000 : Usual
2A	Selection of option/ error input (CN70)	0000 : Filter input 0001 : Alarm input (Air washer, etc.) 0002 : Humidifier input	0002 : Humidifier
2E	HA terminal (CN61) select	0000 : Usual 0001 : Leaving-ON prevention control	0000 : Usual (HA terminal)
30	Automatic elevating grille	0000 : Unavailable (Standard, Oil guard panel) 0001 : Available (Auto grille, Oil guard, Auto grille panel)	0000 : Unavailable
31	Ventilating fan control	0000 : Unavailable 0001 : Available	0000 : Unavailable
32	TA sensor selection	0000 : Body TA sensor 0001 : Remote controller sensor	0000 : Body TA sensor
33	Temperature unit select	0000 : °C (at factory shipment) 0001 : °F	0000 : °C
40	Control for humidifier (+ drain pump control)	0000 : None 0001 : Humidifier + Vaporizing system (Pump ON) 0002 : Humidifier + Ultrasonic system (Pump ON after specified time passed) (Unused) 0003 : Humidifier + Natural drain system (Pump OFF)	0003 : Humidifier ON, Pump OFF
5d	High ceiling selection (Air volume selection)	[4-way Air Discharge Cassette type] and [Under Ceiling type] 0000 : Standard filter 0001 : Super-long life [Concealed Duct Standard type] 0000 : Standard static pressure (40Pa) 0001 : High static pressure 1 (70Pa) 0003 : High static pressure 2 (100Pa) 0005 : Correspond to quiet sound 0006 : Low static pressure (20Pa)	0000 : Standard
60	Timer set (Wired remote controller)	0000 : Available (Operable) 0001 : Unavailable (Operation prohibited)	0000 : Available
62	Smudging-proof control clear	0000 : Clear	4- way Air Discharge Cassette type only
92	Outside interlock release condition	0000 : Operation stop 0001 : Release communication signal receive	0000 : Operation stop

TYPE

Item code [10]

Setup data	Type	Abbreviated Model name
0000	1-way Air Discharge Cassette	MMU-AP XXX SH
0001	4-way Air Discharge Cassette	MMU-AP XXX H
0002	2-way Air Discharge Cassette	MMU-AP XXX WH
0003	1-way Air Discharge Cassette (Compact type)	MMU-AP XXX YH
0004	Concealed Duct Standard	MMD-AP XXX BH
0006	Concealed Duct High Static Pressure	MMD-AP XXX H
0007	Under Ceiling	MMC-AP XXX H
0008	High Wall	MMK-AP XXX H
0010	Floor Standing Cabinet	MML-AP XXX H
0011	Floor Standing Concealed	MML-AP XXX BH
0013	Floor Standing	MMF-AP XXX H
～	—	

Indoor unit capacity

Item code [11]

Setup data	Model
0001	007
0003	009
0005	012
0007	015
0009	018
0011	024
0012	027
0013	030
0015	036
0017	048
0018	056
0021	072
0023	096
～	—

7-1-2. Applied Control in Indoor Unit

■ Remote location ON/OFF control box (TCB-IFCB-4E)

[Wiring and setup]

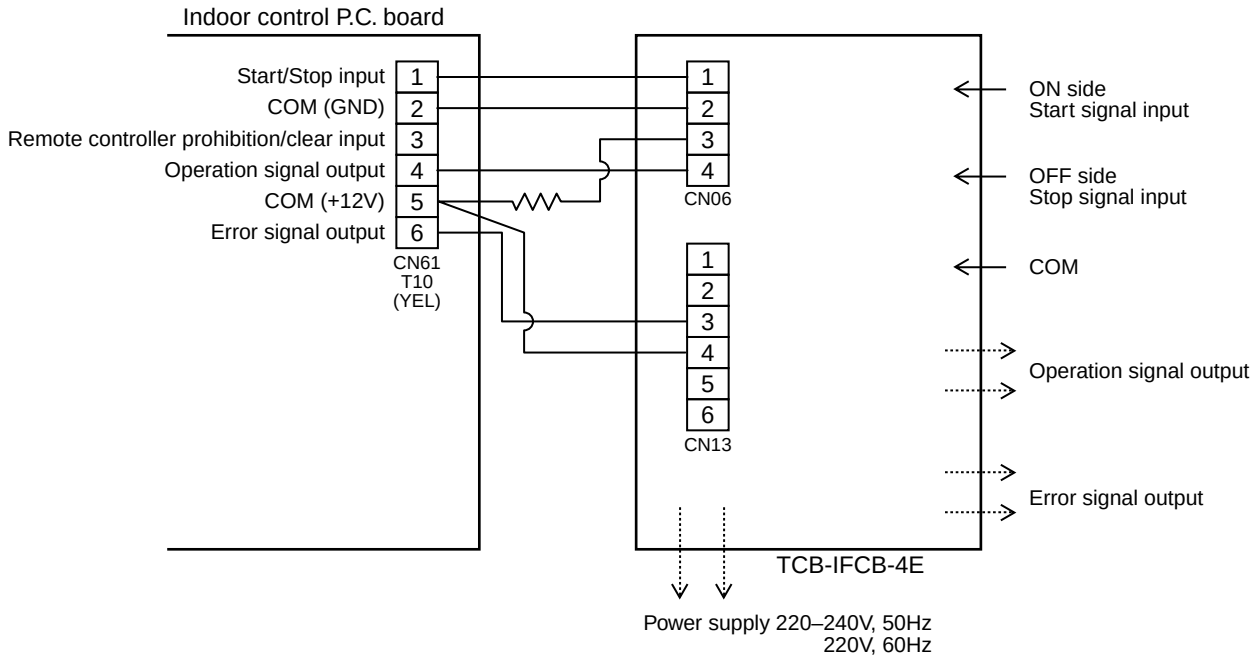
- Use the exclusive connector for connection with the indoor control P.C. board.
- In a group control, the system can operate when connecting with any indoor unit (Control P.C. board) in the group. However when taking out the operation/error signal from the other unit, it is necessary to take out from each unit individually.

(1) Control items

1) Start/Stop input signal : Operation start/stop in unit
2) Operation signal : Output during normal operation
3) Error signal : Output during alarm
(Serial communication error or indoor/outdoor protective device) operation

(2) Wiring diagram using remote control interface (TCB-IFCB-4E)

Input IFCB-4E : No voltage ON/OFF serial signal
Output No voltage contact for operation, error display
Contact capacity: Below Max. AC240V 0.5A



■ Ventilating fan control from remote controller

[Function]

- The start/stop operation can be operated from the wired remote controller when air to air heat exchanger or ventilating fan is installed in the system.
- The fan can be operated even if the indoor unit is not operating.
- Use a fan which can receive the no-voltage A contact as an outside input signal.
- In a group control, the units are collectively operated and they can not be individually operated.

(1) Operation

Handle a wired remote controller in the following procedure.

∗ Use the wired remote controller during stop of the system.

∗ Be sure to set up the wired remote controller to the header unit. (Same in group control)

∗ In a group control, if the wired remote controller is set up to the header unit, both header and follower units are simultaneously operable.

1 Push concurrently [SET] + [CL] + [🔧] buttons for 4 seconds or more.

The unit No. displayed firstly indicates the header indoor unit address in the group control.

In this time, the fan of the selected indoor unit turns on.

2 Every pushing [UNIT] button, the indoor unit numbers in group control are displayed successively.

In this time, the fan of the selected indoor unit only turns on.

3 Using the setup temp [▲] or [▼] button, specify the item code 31.

4 Using the timer time [▲] or [▼] button, select the setup data. (At shipment: 0000)

The setup data are as follows:

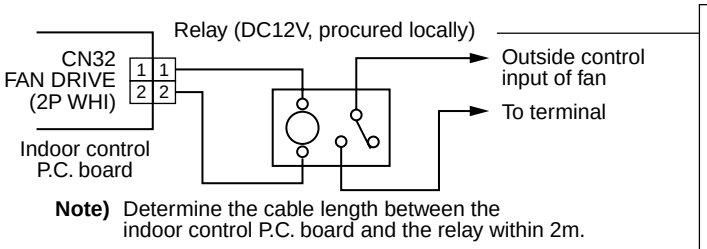
Setup data	Handling of operation of air to air heat exchanger or ventilating fan
0000	Unavailable (At shipment)
0001	Available

5 Push [SET] button. (OK if display goes on.)

- To change the selected indoor unit, go to the procedure **2**).
- To change the item to be set up, go to the procedure **3**).

6 Pushing [🔧] returns the status to the usual stop status.

(2) Wiring



Note) Determine the cable length between the indoor control P.C. board and the relay within 2m.

4-way Air Discharge Cassette type
Concealed Duct Standard type
Under Ceiling type
High Wall type
} model :

Corresponds up to a relay in which rated current of the operation coil is approx. 75mA

Other type models:

Correspond up to a relay in which rated current of the operation coil is approx. 16mA (Does not correspond to a terminal block type relay on the market.)

■ Leaving-ON prevention control

[Function]

- This function controls the indoor units individually. It is connected with cable to the control P.C. board of the indoor unit.
- In a group control, it is connected with cable to the indoor unit (Control P.C. board), and the item code 2E is set to the connected indoor unit.
- It is used when the start operation from outside if unnecessary but the stop operation is necessary.
- Using a card switch box, card lock, etc, the forgotten-OFF of the indoor unit can be protected.
  - When inserting a card, start/stop operation from the remote controller is allowed.
  - When taking out a card, the system stops if the indoor unit is operating and start/stop operation from the remote controller is forbidden.

(1) Control items

1) Outside contact ON : The start/stop operation from the remote controller is allowed.
(Status that card is inserted in the card switch box)

2) Outside contact OFF : If the indoor unit is operating, it is stopped forcedly.
(Start/Stop prohibited to remote controller)
(Status that card is taken out from the card switch box)

∗ When the card switch box does not perform the above contact operation, convert it using a relay with b contact.

(2) Operation

Handle the wired remote controller switch in the following procedure.

∗ Use the wired remote controller switch during stop of the system.

1 Push concurrently SET + CL + 🔧 buttons for 4 seconds or more.

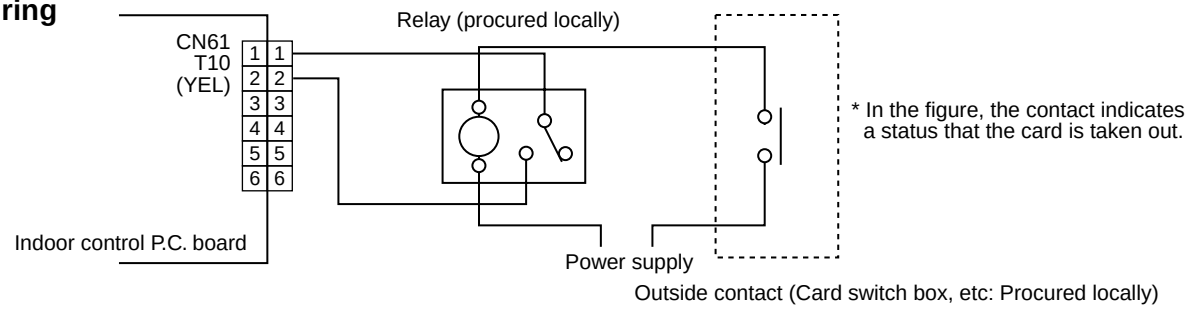
2 Using the setup temp ▲ or ▼ button, specify the item code 2E.

3 Using the timer time ▲ or ▼ button, set 0001 to the setup data.

4 Push SET button.

5 Push 🔧 button. (The status returns to the usual stop status.)

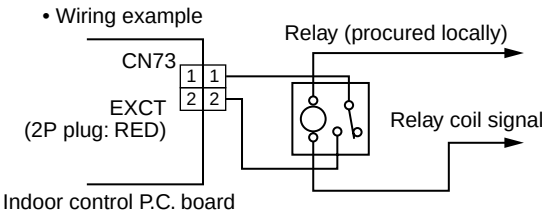
(3) Wiring



Note) Determine the cable length between the indoor control P.C. board and the relay within 2m.

■ Power peak-cut from indoor unit

When the relay is turned on, a forced thermostat-OFF operation starts.



Note) Determine the cable length between the indoor or outdoor control P.C. board and the relay within 2m.

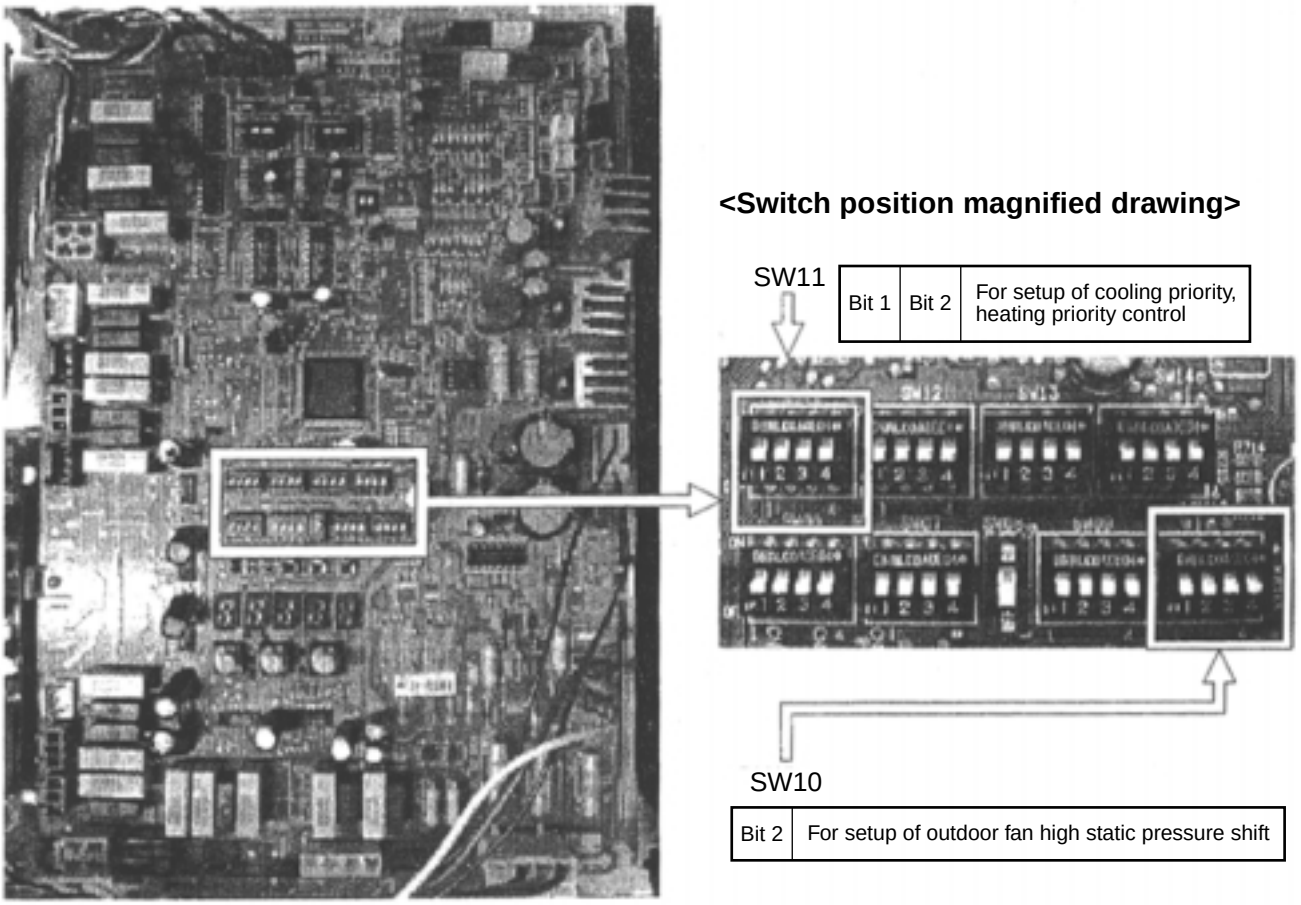
7-2. Outdoor Unit

7-2-1. Applied Control in Outdoor Unit

The following functions become available by setting the switches on the outdoor interface P.C. board.

No.	Function	Switch No.	Bit
1	Outdoor fan high static pressure shift	SW10	2
2	Cooling priority, Heating priority control	SW11	1, 2

<Interface P.C. board of outdoor unit>



7-2-1-1. Outdoor fan High Static Pressure Shift

■ Usage/Features

This function is set when connecting a duct to discharge port of the outdoor unit.

■ Setup

Turn “Bit 2” of the Dip switch [SW10] on the interface P.C. board of the outdoor unit to ON side. For the outdoor units which are connected with the ducts, set this function regardless of the header unit or follower unit.

■ Specifications

Increase No. of rotations of the propeller fan of the outdoor fan so that a duct with the maximum outside static pressure 35Pa (3.5mmAq) can be installed. If installing a discharge duct (Below 35Pa (3.5mmAq)) exceeding the duct resistance 15Pa (1.5mmAq), execute this setup.

Discharge air volume in each outdoor unit is described in the following table.

Capacity rank (MMY-MAP)	0501, 0601 type	0801 type	1001, 1201 type
Standard air volume of outdoor unit (m^3/min.)	150	165	175

7-2-1-2. Cooling Priority, Heating Priority Control

■ Usage/Features

Cooling priority or heating priority can be selected.

There are the following four patterns in selecting setup of the priority mode. Select a priority mode based upon the demand of the destination to be installed.

■ Setup

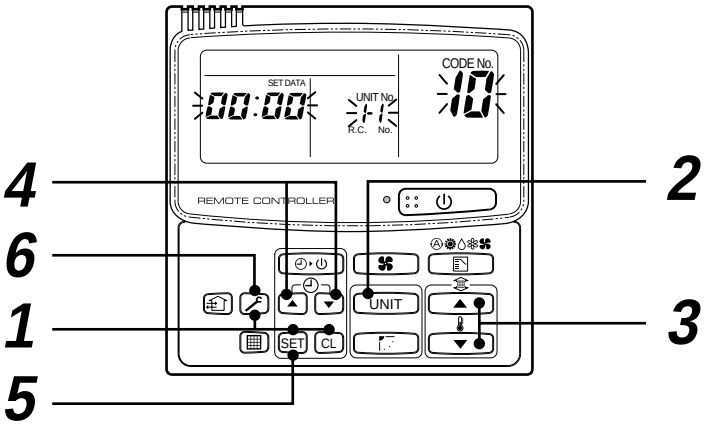
(Note) In “Specific indoor unit priority” mode only, it is necessary to set up an indoor unit only which you desire to give priority.

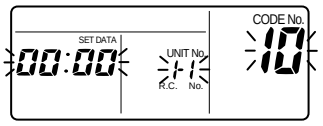
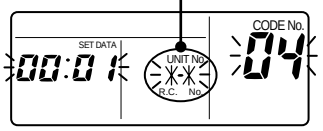
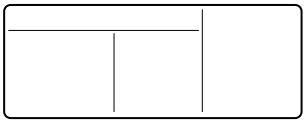
1. Outdoor unit (Header unit only) setup

SW11		**Operation**
Bit 1	**Bit 2**	
OFF	OFF	Heating priority (Setup at shipment)
ON	OFF	Cooling priority
OFF	ON	No. of operating units (Priority is given to operation mode with which much more units operate.)
ON	ON	Specific indoor unit priority (Priority is given to operation mode of the indoor unit to which the operation mode priority has been set up.)

2. Indoor unit setup in “Specific indoor unit priority” mode

The setup can be changed during stop of operation. (Be sure to stop the system.)



Procedure	Operation contents
1	When pushing [SET] + [CL] + [🔧] buttons at the same time for 4 seconds or more, as shown in the figure, the display section flashes after a while confirm the displayed item code is [10]. • When the item code is one other than [10], push [🔧] button to eliminate the display and then repeat the procedure from the first step. (The remote controller operation is not accepted approx. 1 minute after pushing [🔧] button.) (In a group control, the indoor unit with number displayed firstly is set to the header unit.) 
2	Every pushing [UNIT], the indoor unit numbers in the group control are successively displayed. Select the indoor unit of which setup is to be changed. In this time, as the fan and louver of the selected indoor unit operate, the position of the indoor unit of which setup is to be changed can be confirmed.
3	Using the setup temperature [▲] and [▼] buttons, specify the item code [04].
4	Using the timer time [▲] and [▼] buttons, select the setup data [0001]. Priority: 0001 , No priority: 0000 
5	Push [SET] button. In this time, the setup operation finishes when the display changes from flashing to lighting.
6	After setup operation has finished, push [🔧] button. (Setup is determined.) When pushing [🔧] button, the display disappears and the status returns to the usual stop status. (The remote controller operation is not accepted for approx. 1 minute.) 

(NOTE)

Only one indoor unit can be set to “Priority”. If the multiple indoor units are accidentally set to “Priority”, an error code (L05 or L06: Duplicated indoor unit priority) is displayed.

To the unit displaying “L05”, [0001 (Priority)] is setup. Separate a unit which you will give priority from the other indoor units, and return the setup data of the other indoor units to [0000 (No priority)].

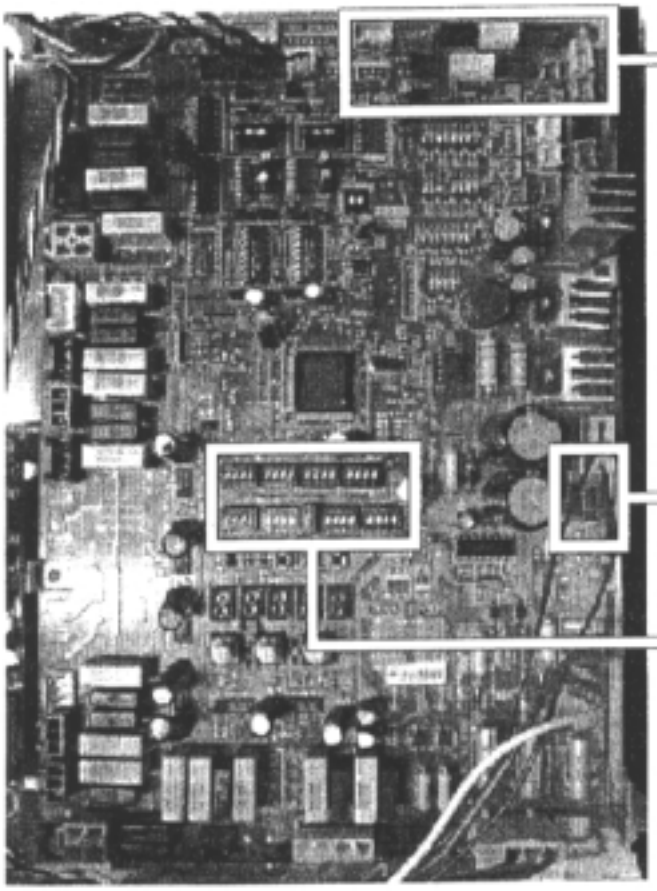
Error code	Error contents
L05	Indoor unit priority duplication ([0001] is set up.)
L06	Indoor unit priority duplication ([0000] is set up.)

7-2-2. Applied Control in Outdoor Unit

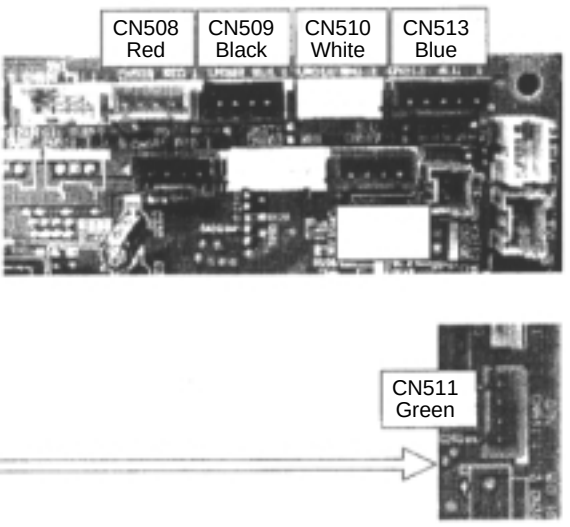
The following functions become available by using a control P.C. board sold separately.
Set up the switches or the header outdoor unit (U1).

No.	Function	Switch No.	Bit	Connector No.	Used control P.C. board
1	Power peak-cut control (Standard)	SW07	1	CN513	TCB-PCDM2E
2	Power peak-cut control (Expansion)	SW07	1,2	CN513	TCB-PCDM2E
3	Snowfall fan control	—	—	CN509	TCB-PCMO2E
4	External master ON/OFF control	—	—	CN512	TCB-PCMO2E
5	Night operation control	—	—	CN508	TCB-PCMO2E
6	Operation mode selection control	—	—	CN510	TCB-PCMO2E

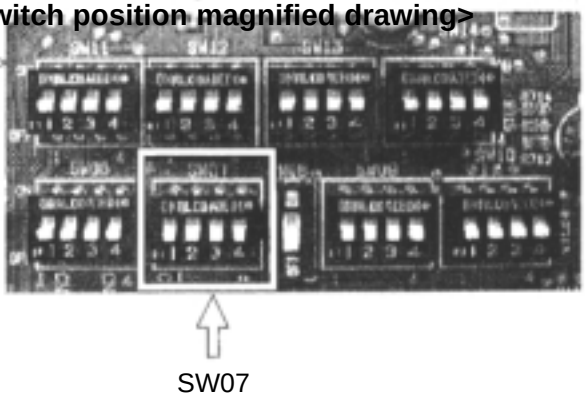
<Outdoor unit interface P.C. board>



<Connector position magnified drawing>



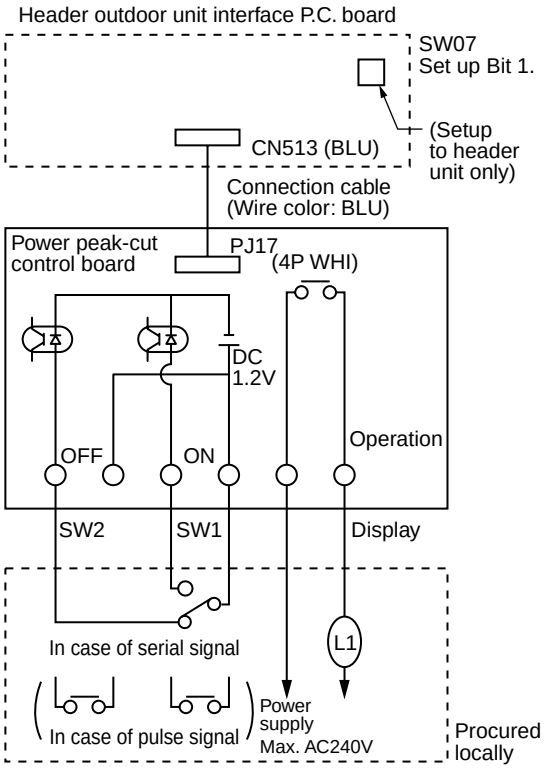
<Switch position magnified drawing>



SW07

Bit 1	For power peak-cut control selection
Bit 2	For power peak-cut control (expansion) selection

7-2-2-1. Power Peak-cut Control (Standard)



Operation

The upper limit capacity of the outdoor unit is restricted based on the demand request signal from outside.

L1 : Display lamp during power peak-cut control

SW1 : Power peak-cut ON switch
(ON during demand, OFF in normal time) ∗1

SW2 : Power peak-cut OFF switch
(OFF during demand, ON in normal time) ∗1

*1

Input signals of SW1 and SW2 are acceptable even if they are longer then pulse input (100mm.sec.) or serially made.

However do not turn on SW1 and SW2 simultaneously.

∗ Be sure to prepare a contact for each terminal.

Relay contact capacity of "operation" port

Below AC240V 1A (COSØ = 100%)

Below DC24V 2A (Non-inductive load)

Note) When connecting non-inductive load such as relay coil to L1 load, insert the noise surge absorber CR (In case of AC) or counter electromotive-proof diode (In case of DC) into the bypass circuit.

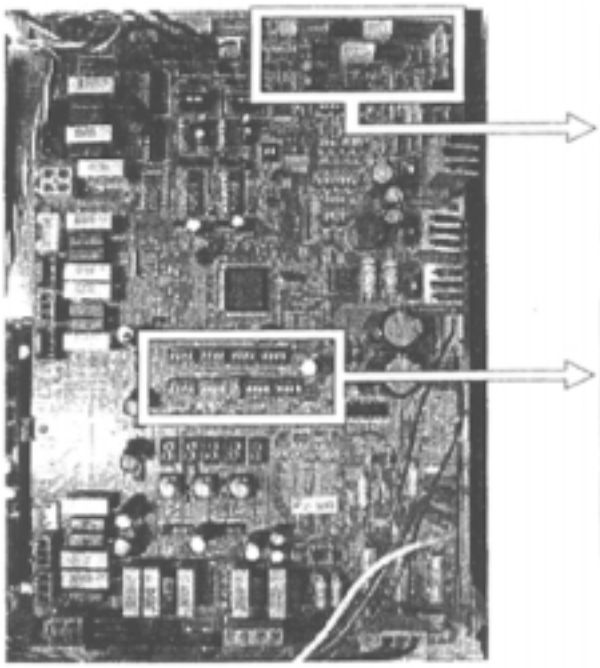
Power peak-cut control board: TCB-PCDM2E

Outdoor unit destination to be connected becomes the header outdoor unit (U1).

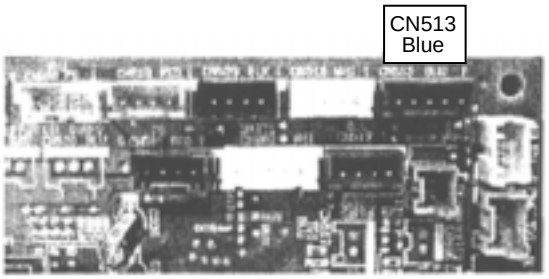
Setup when Power peak-cut control requested

Power peak-cut control board (TCB-PCDM2E)	SW1	SW2	L1	Outdoor unit interface P.C. board	
				SW07: Bit 1 OFF	SW07: Bit 1 ON
Power peak-cut ON signal is input.	ON	OFF	ON	0% (Forced stop)	Capacity 60% (Upper limit restriction)
Power peak-cut OFF signal is input.	OFF	ON	OFF	100% (Usual operation)	100% (Usual operation)

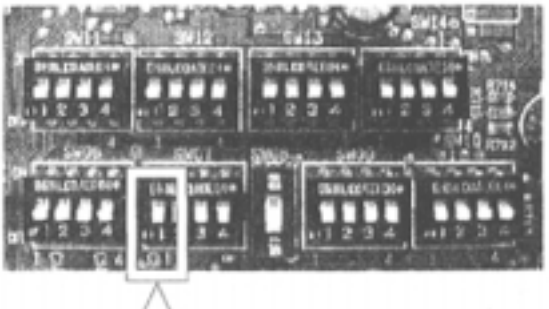
<Setup positions of header outdoor unit interface P.C. board>



<Connector position magnified drawing>

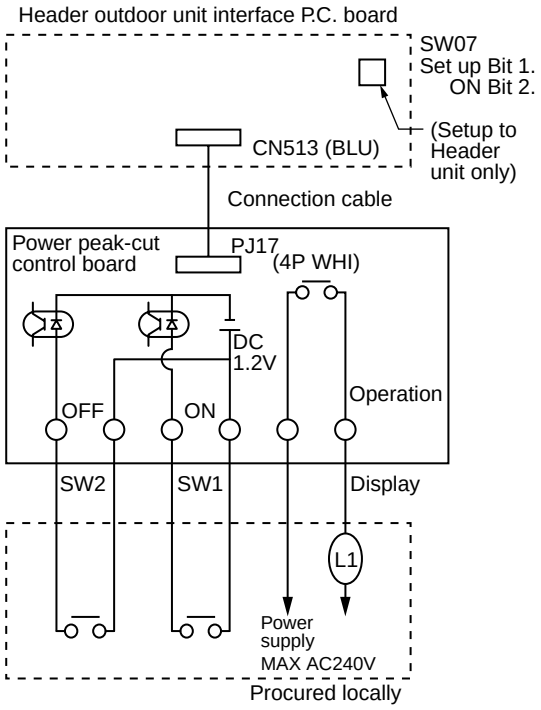


<Switch position magnified drawing>



Bit 1	OFF	Operation stop to 100%
	ON	ON 60% to 100%

7-2-2-2. Power Peak-cut Control (Expansion)



Operation

The upper limit capacity of the outdoor unit is restricted based on the demand request signal from outside.

L1 : Display lamp during Power peak-cut control

SW1 : Power peak-cut ON switch ∗1

SW2 : Power peak-cut OFF switch ∗1

***1**

Input signals of SW1 and SW2 are acceptable even if they are upper than pulse input (100mm. sec.) or serially made.

∗ Be sure to prepare a contact for each terminal.

Relay contact capacity of "operation" port

Below AC240V 1A (COSØ = 100%)

Below DC24V 2A (Non-inductive load)

Note) When connecting non-inductive load such as relay coil to L1 load, insert the noise surge absorber CR (In case of AC) or counter electromotive-proof diode (In case of DC) into the bypass circuit.

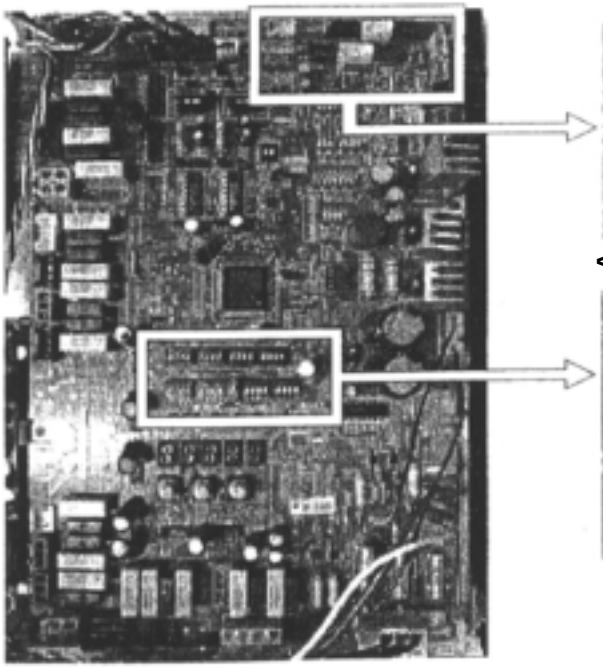
Power peak-cut control board: TCB-PCDM2E

Outdoor unit destination to be connected becomes the header outdoor unit (U1).

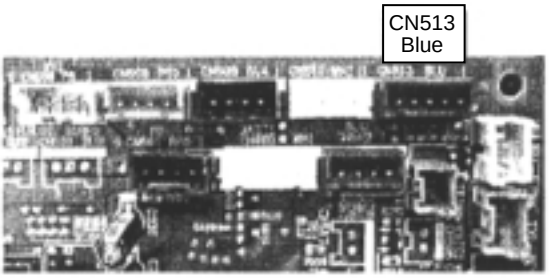
Setup at power peak-cut control (expansion) request

Control lamp	Outside power peak-cut request		Power Peak-cut request I/F SW07, Bit 1	
L1	SW1	SW2	**OFF time**	**ON time**
OFF	OFF	OFF	100% (Normal operation)	100% (Normal operation)
ON	ON	OFF	80% (Upper limit restriction)	85% (Upper limit restriction)
ON	OFF	ON	60% (Upper limit restriction)	75% (Upper limit restriction)
ON	ON	ON	0% (Forced stop)	60% (Upper limit restriction)

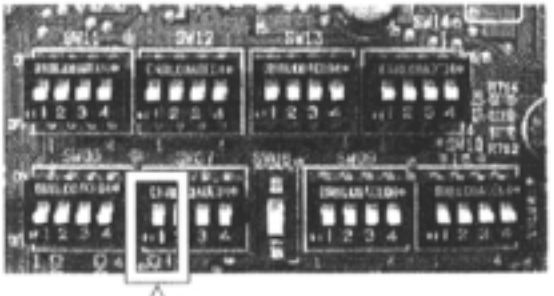
<Setup positions of header outdoor unit interface P.C. board>



<Connector position magnified drawing>



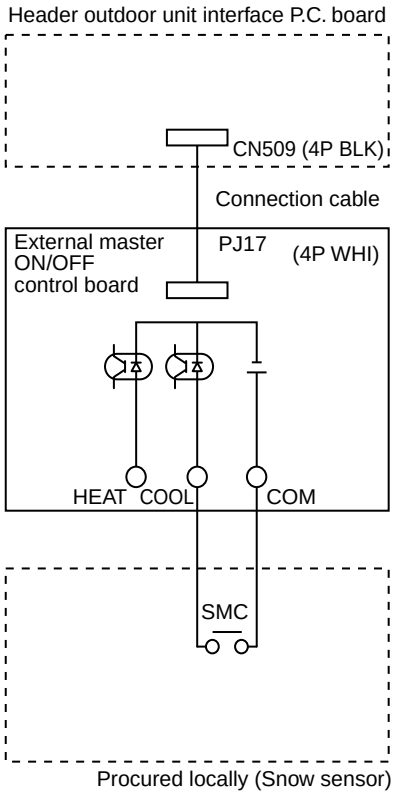
<Switch position magnified drawing>



SW07

Bit 1	OFF	Operation stop to 60%, 80%, 100%
	ON	ON 60% to 60%, 75%, 85%, 100%
Bit 2	ON	Power peak-cut (expansion) ON

7-2-2-3. Snowfall Fan Control



Operation

The outdoor unit fan operates by the Snowfall signal from outside.

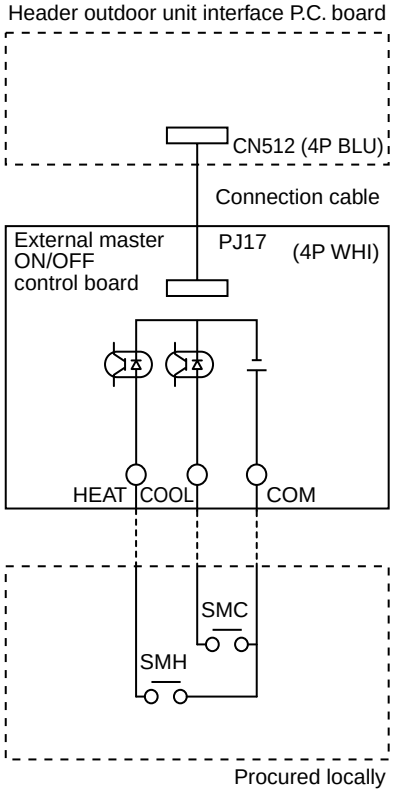
Terminal	Input signal	Operation
COOL (SMC)	ON → OFF	Snowfall fan control (Operates outdoor unit fan.)
	ON → OFF	Usual operation (Releases control.)

The control contents are accepted during leading and trailing of the input signal.
(The status of leading and trailing should be held for 100mm. sec. or more.)

External master ON/OFF control board : TCB-PCM02E
Outdoor unit destination to be connected becomes the header outdoor unit (U1).

SMC: Cooling Mode Select (switch)

7-2-2-4. External master ON/OFF control



Operation

The outdoor unit starts or stops the system.

Terminal	Input signal	Operation
COOL (SMC)	ON → OFF	Starts collectively indoor units.
Heat (SMH)	ON → OFF	Stops collectively indoor units.

The control contents are accepted during trailing of the input signal.
(The status of trailing should be held for 100m. sec. or more.)

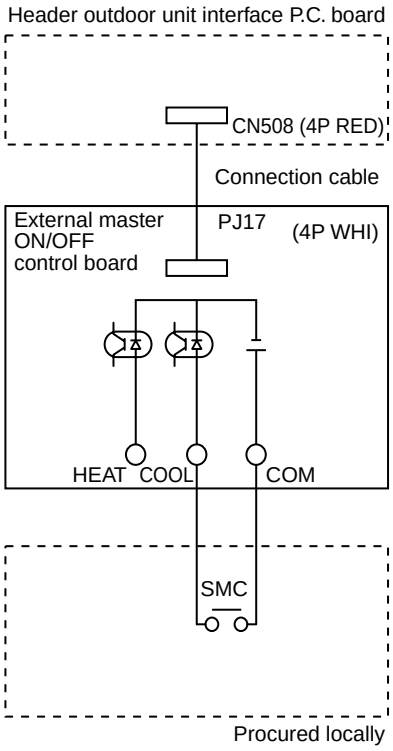
NOTES

1) Do not turn on COOL and HEAT terminals concurrently.
2) Be sure to prepare a contact for each terminal.
   Outside signal: No voltage pulse contact

External master ON/OFF control board : TCB-PCM02E
Outdoor unit destination to be connected becomes the header outdoor unit (U1).

SMH: Heating Mode Select (switch)

7-2-2-5. Night Operation Control



Operation

The noise decreases in the night.

Terminal	Input signal	Operation
COOL (SMC)	ON → OFF	Night (sound reduction) operation control
	ON → OFF	Usual operation

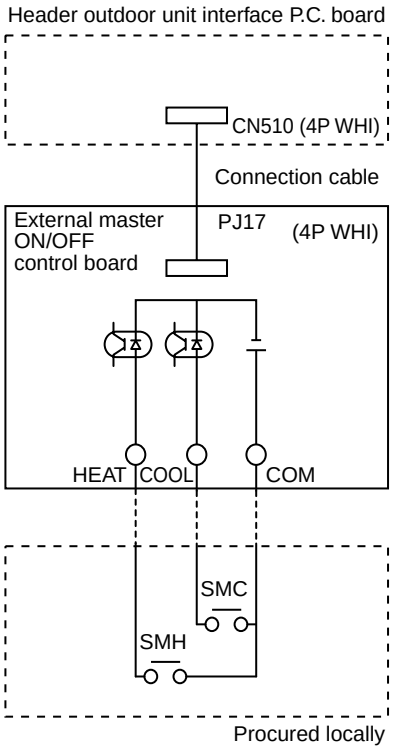
The control contents are accepted during leading and trailing of the input signal.
(The status of leading and trailing should be held for 100mm. sec. or more.)
Capacity criterion during night operation control
Capacity during control indicates values as described in the following table.

	Night operation sound reduction dB (A)	Capacity	
		COOL	HEAT
1201 type	50	Approx. 55%	Approx. 45%
1001 type	50	Approx. 65%	Approx. 55%
0801 type	50	Approx. 80%	Approx. 70%
0601 type	50	Approx. 75%	Approx. 70%
0501 type	50	Approx. 85%	Approx. 80%

(Against Max. capacity)

External master ON/OFF control board : TCB-PCM02E
Outdoor unit destination to be connected becomes the header outdoor unit (U1).

7-2-2-6. Operation Mode Selection Control



Operation

SMC: COOL mode specification input switch
SMH: HEAT mode specification input switch
This control can be operated with the operation mode which is permitted by SMC or SMH.
The indoor unit operating by operation mode without permission is as follows:

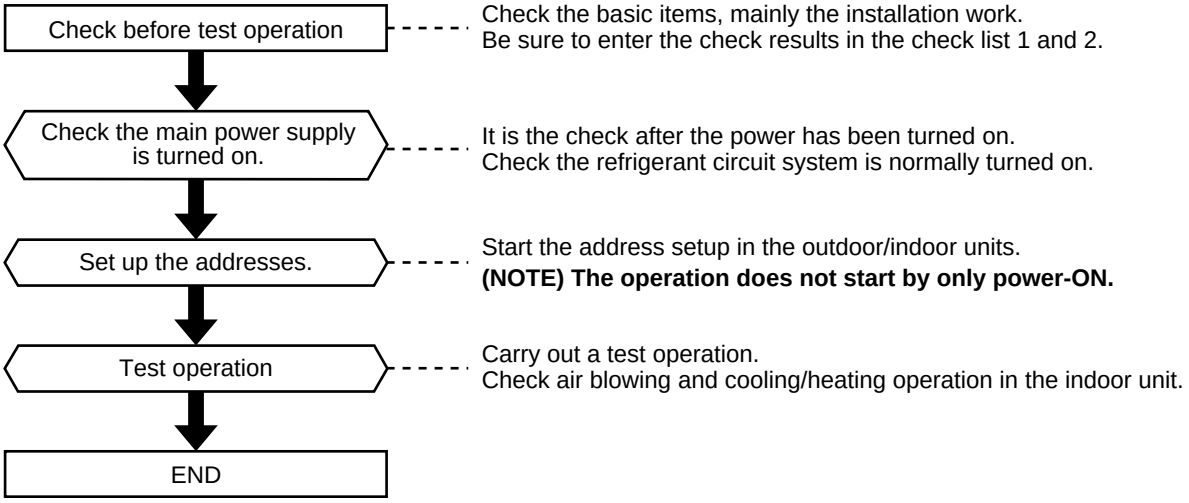
1) Display on remote controller
   "Mode select controlled" goes on.
2) Indoor fan
   In FAN mode: Fan normally operates.
   In COOL mode: Fan normally operates.
   In HEAT mode: Fan operates with ultra low speed.
   * Be sure to prepare a contact for each contact terminal.
     Outside signal: No voltage serial contact

External master ON/OFF control board : TCB-PCM02E
Outdoor unit destination to be connected becomes the header outdoor unit (U1).

8. TEST OPERATION

8-1. Procedure and Summary of Test Operation

A test operation is executed in the following procedure. When a trouble or an error occurs in each step, remove causes of a trouble or an error referring to the section "**9. Troubleshooting**".



8-2. Check Items before Test Operation

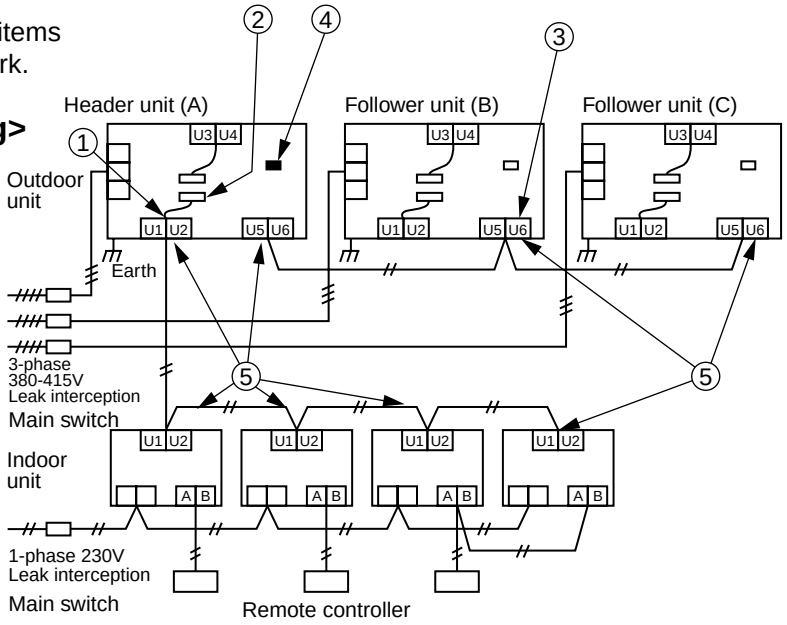
Prior to the test operation, check the following items so that there is no trouble in the installation work.

<Main check items for electric wiring>

The communication system differs from that of R22 or R407 refrigerant "Modular Multi system" air conditioner.

Check again cautious points on wiring.

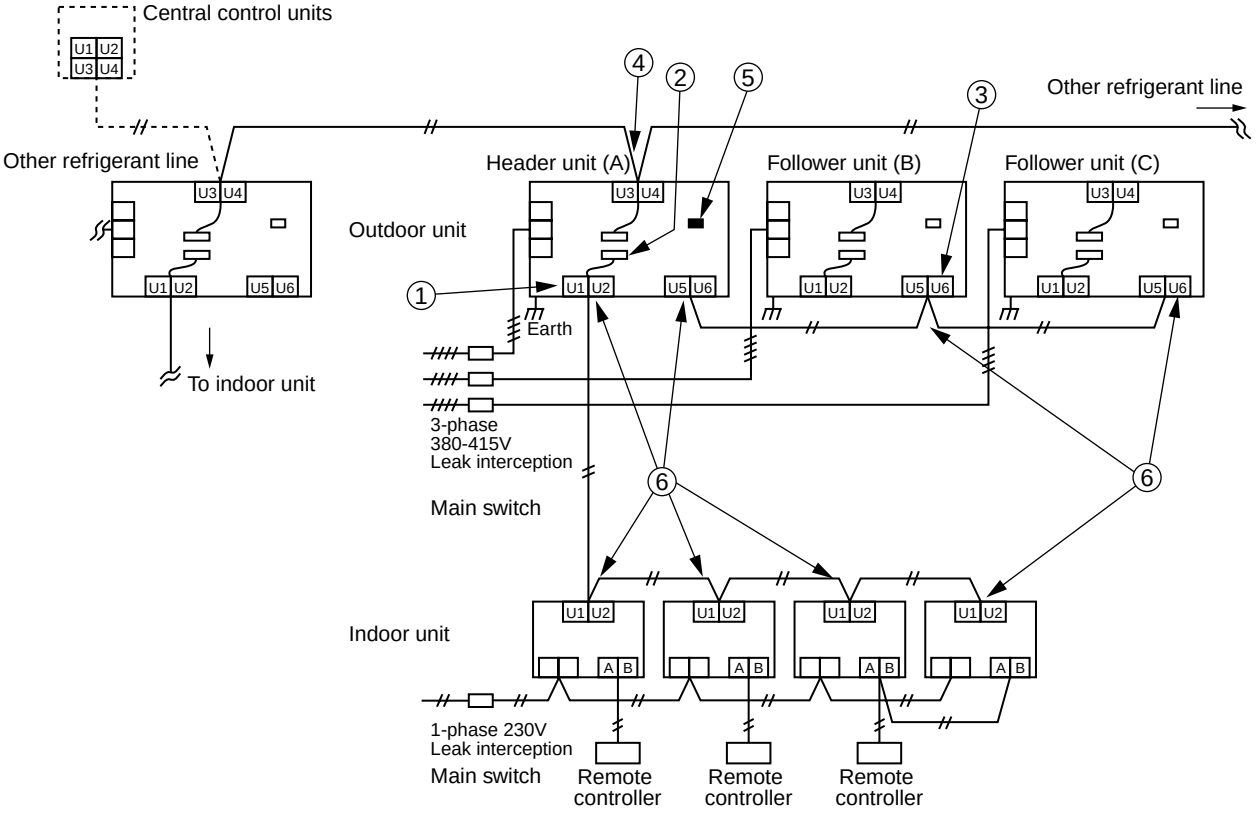
1. In case that a center control system is not connected:



No.	Main check items	Check
①	Are indoor and outdoor communication lines of the header unit connected to U1/U2 terminals?	
②	Is the relay connector between U1/U2 terminal and U3/U4 terminal removed? (Set up at shipment from the factory)	
③	Is the communication line between each outdoor units connected to U5/U6 terminal?	
④	Is the terminal resistance (SW30-2) on the interface P.C. board of the header unit turned on? (Set up at shipment from the factory)	
⑤	Is the end terminal of the shield cable grounded?	

NOTE) The above figure does not show all the electric cables.
For details, refer to the installation manuals for outdoor unit, indoor unit, remote controller, or optional devices.

2. In case that a central control system is connected (Before address setup)



No.	Main check items	Check
①	Are indoor and outdoor communication lines of the header unit connected to U1/U2 terminals?	
②	Is the relay connector between U1/U2 terminal and U3/U4 terminal removed? (Set up at shipment from the factory) (Before address setup, remove the relay connector.)	
③	Is the communication line between outdoor and indoor units connected to U5/U6 terminal?	
④	Is the communication line of the central control system connected to the header unit U3/U4 terminals of each refrigerant line? (The communication line of the central control system may be connected to the communication lines of the indoor/outdoor communication lines.)	
⑤	Is the terminal resistance (SW30-2) on the interface P.C. board of the header unit turned on? (Set up at shipment from the factory) (After address setup, turn off SW30-2 of the header unit except the smallest unit after check of trial operation.)	
⑥	Is the end terminal of the shield cable grounded?	
⑦	When the refrigerant line and the central control system of the custom air conditioner are connected: → Are TCC-LINK adaptors correctly connected? → When the digital inverter air conditioner operates with group operation, twin, or triple operation, are the adopters connected to the header unit of the indoor unit?	

NOTE) The above figure does not show all the electric cables.

For details, refer to the installation manuals for outdoor unit, indoor unit, remote controller, or optional devices.

<Check list 1>

- Using the “Check list 1”, check there is no trouble in the installation work.

Is capacity of the leak breaker appropriate?	Outdoor total capacity ☐ A	Header unit (A) ☐ A Follower unit (B) ☐ A Follower unit (C) ☐ A Follower unit (D) ☐ A	Indoor unit ☐ A	
Is diameter of the power cable correct?		Header unit (A) ☐ mm² Follower unit (B) ☐ mm² Follower unit (C) ☐ mm² Follower unit (D) ☐ mm²	Indoor unit ☐ mm²	
Is control communication line correct?		Indoor –outdoor connection terminals (U1, U2) ☐ Outdoor–outdoor connection terminals (U5, U6) ☐ Central control system connection terminals (U3, U4) ☐		
Is power of indoor units supplied collectively?				
Is earth grounded				
Is insulation good?				
Is the main power voltage good?		☐ V		
Is diameter of connecting pipe correct?				
Is the branch kit correct?				
Is drain water of the indoor unit arranged so that it flows without accumulation?				
Is thermal insulation of pipes good? (Connecting pipes, Branch kit)				
Is not short-circuit of discharge air in indoor/outdoor units?				
After airtight test for pipes, are vacuuming and adding of refrigerant executed?				

Are valves of all the outdoor units fully opened?	Gas side	Liquid side	Balance side
Header unit (A)	☐	☐	☐
Follower unit (B)	☐	☐	☐
Follower unit (C)	☐	☐	☐
Follower unit (D)	☐	☐	☐

• Check the additional amount of refrigerant.

<Check list 2>

Calculate the additional amount of refrigerant from the additional amount of refrigerant (A) by the pipe diameter at liquid side and the pipe length to be connected and the corrective amount of refrigerant (C) by the system capacity.

Additional amount of refrigerant = Actual liquid pipe length × Additional amount of refrigerant per liquid pipe 1m + Corrective amount of refrigerant by system capacity

(A) (C)

Firstly enter the total length for each liquid pipe in the following table, and then calculate the additional amount of refrigerant by pipe length.

<Additional amount of refrigerant by pipe length>

Pipe dia at liquid side	Standard amount of refrigerant kg/m	Total pipe length at each liquid side	Additional amount of refrigerant pipe dia at each liquid side kg
Ø6.4	0.025 ×	=	kg
Ø9.5	0.055 ×	=	kg
Ø12.7	0.105 ×	=	kg
Ø15.9	0.160 ×	=	kg
Ø19.0	0.250 ×	=	kg
Ø22.2	0.3505 ×	=	kg
		Additional amount of refrigerant by pipe length (A)	kg

Next, refer to the following table for the corrective amount of refrigerant (C) by system capacity.

<Corrective amount of refrigerant by system capacity>

System horse power HP						System horse power HP	Normal type				
	Unit 1	Unit 2	Unit 3	Unit 4	Corrective amount of refrigerant (C) kg		Unit 1	Unit 2	Unit 3	Unit 4	Corrective amount of refrigerant (C) kg
5	5				0	28	10	10	8		–2.0
6	6				0	30	10	10	10		0
8	8				1.5	32	8	8	8	8	–6.0
10	10				2.5	32	12	10	10		1.0
12	12				3.5	34	10	8	8	8	–6.0
14	8	6			0	34	12	12	10		3.0
16	8	8			0	36	10	10	8	8	–6.0
18	10	8			0	36	12	12	12		4.0
20	10	10			3.0	38	10	10	10	8	–6.0
22	8	8	6		0	40	10	10	10	10	–5.0
22	12	10			5.0	42	12	10	10	10	–4.0
24	8	8	8		–4.0	44	12	12	10	10	–2.0
24	12	12			7.0	46	12	12	12	10	0
26	10	8	8		–4.0	48	12	12	12	12	2.0

Lastly add the additional amount of refrigerant by pipe length (A) to the corrective amount of refrigerant by system capacity (C). It is the final additional amount of refrigerant.

As the result, If minus sign is indicated, do not add the refrigerant (=0kg).

<Additional amount of refrigerant>

Additional amount of refrigerant by pipe length (A)	kg
Corrective amount of refrigerant by system HP (C)	kg
Additional amount of refrigerant	kg

8-3. Check at Main Power-ON

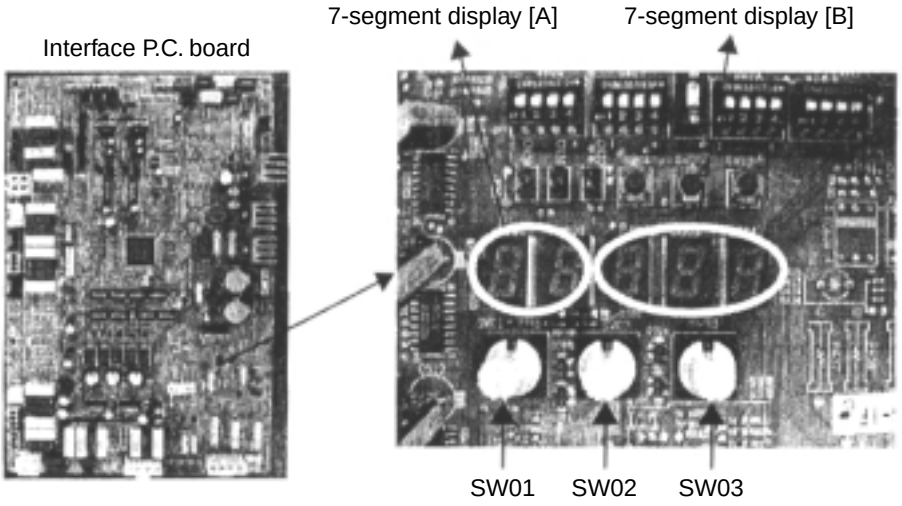
After turning on the main power of the indoor units and outdoor unit in the refrigerant line to be executed with a test operation, check the following items in each outdoor and indoor unit.

(After turning on the main power, be sure to check in order of indoor unit → outdoor unit.)

<Check on outdoor unit>

1. Check that all the rotary switches, SW01, SW02, and SW03 on the interface P.C. board of the header unit are set up to "1".
2. If other error code is displayed on 7-segment [B], remove the cause of trouble referring to "**9. Troubleshooting**".
3. **Check that [L08] is displayed on 7-segment display [B]** on the interface P.C. board of the header unit. (L08: Indoor address unset up)

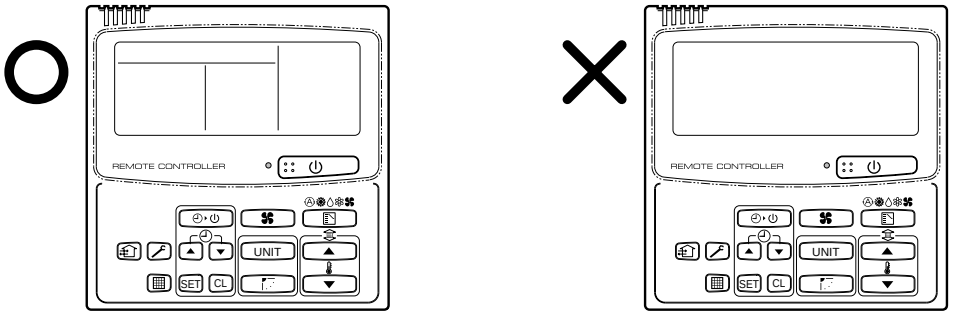
   (If the address setup operation has already finished in service time, etc, the above check code is not displayed, and only [U1] is displayed on 7-segment display [A].)



<Check on indoor unit>

1. Display check on remote controller (In case of wired remote controller)

   Check that a frame as shown in the following left figure is displayed on LC display section of the remote controller.



Normal status
(Power and operation stop)

Abnormal status
(Power is not normally turned on.)

If a frame is not displayed as shown in the above right figure, the power of the remote controller is not normally turned on. Therefore check the following items.

- Check power supply of indoor unit.
- Check cabling between indoor unit and remote controller.
- Check whether there is cutoff of cable around the indoor control P.C. board or not, and check connection failure of connectors.
- Check failure of transformer for the indoor microcomputer.
- Check indoor control P.C. board failure.

8-4. Address Setup

After power-ON, set up the indoor address from the interface P.C. board of the header unit.

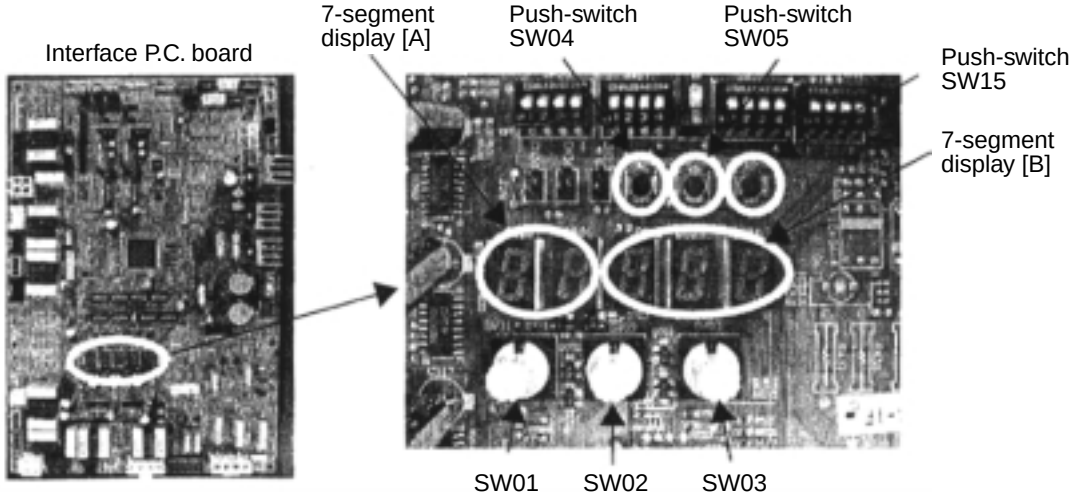
(The address setup operation cannot be performed by power-ON only.)

8-4-1. Cautions

1. It requires approx. 5 minutes usually for 1 line to automatically set up address.
   However in some cases, it may require maximum 10 minutes.
2. It is unnecessary to operate the air conditioner for address setup.
3. Manual address setup is also available besides automatic setup.
   Automatic address: Setup from SW15 on the interface P.C. board of the header unit
   Manual address: Setup from the wired remote controller.
   (For details, refer to section "**8-4-3. Address setup procedure**")

8-4-2. Address Setup and Check Procedure

<table>
<tr><th>Procedure</th><th>Item</th><th>Operation and check contents</th></tr>
<tr><td>1</td><td>Indoor unit power-ON</td><td>Turn on power of indoor unit in refrigerant line to which address is set up.</td></tr>
<tr><td>2</td><td>Outdoor unit power-ON</td><td>Turn on power of all the outdoor units in refrigerant line to which address is set up.</td></tr>
<tr><td>3</td><td>7-segment display check</td><td>Check that [L08] is displayed on 7-segment display [B] on the interface P.C. board of the header unit in the system to which address is set up.</td></tr>
<tr><td>4</td><td>Address setup start</td><td>Confirm the corresponding items in "8-4-3 Address setup procedure", and then set up address according to the operation procedure.
(Be sure that the setup operation may differ in group control or central control.)
Note) Address cannot be set up if switches are not operated.</td></tr>
<tr><td>5</td><td>Display check after setup</td><td>• After address setup, [U1] is displayed in 7-segment display section.
• For follower outdoor units, [U2] to [U4] are displayed in 7-segment display [A].
• If an error code is displayed in 7-segment display [B], remove the cause of trouble referring to "9. Troubleshooting".</td></tr>
<tr><td>6</td><td>System information check after setup</td><td>Using 7-segment display function, check the system information of the scheduled system.
(This check is executed on the interface P.C. board of the header unit.)
<table>
<tr><th></th><th colspan="3">Rotary switch setup</th><th colspan="2">7-segment display</th></tr>
<tr><th></th><th>SW01</th><th>SW02</th><th>SW03</th><th>[A]</th><th>[B]</th></tr>
<tr><td>System capacity</td><td>1</td><td>2</td><td>3</td><td>[No. of HP]</td><td>[HP]</td></tr>
<tr><td>No. of connected outdoor units</td><td>1</td><td>3</td><td>3</td><td>[No. of units]</td><td>[P]</td></tr>
<tr><td>No. of connected indoor units</td><td>1</td><td>4</td><td>3</td><td>[Connected No. of units]</td><td></td></tr>
</table>
After the above checks, return rotary switches SW01, SW02, SW03 to 1/1/1.</td></tr>
</table>



<Rotary switches>

8-4-3. Address Setup Procedure

In this air conditioner, it is required to set up address to the indoor unit before starting operation. Set up the address according to the following setup procedure.

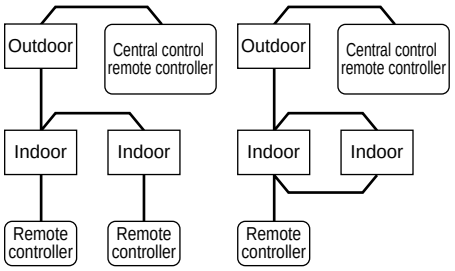
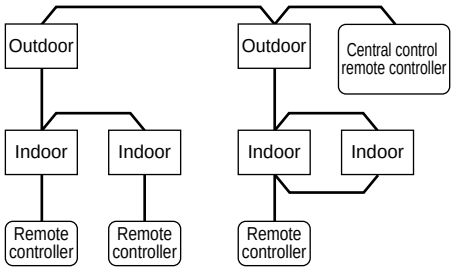
CAUTIONS

1. Set up address after wiring work.
2. Be sure to turn on the power in order of indoor unit → outdoor unit. If turning on the power in the reverse order, a check code [E19] (Error of No. of header units) is output. When a check code is output, turn on the power again.
3. It requires maximum 10 minutes (Usually, approx. 5 minutes) to set up automatically an address to 1 line.
4. To set up an address automatically, the setup at outdoor side is necessary.
   (Address setup cannot be performed by power-ON only.)
5. To set up an address, it is unnecessary to operate the air conditioner.
6. Manual address setup is also available besides automatic setup.
   Automatic address : Setup from SW15 on the interface P.C. board of the header unit
   Manual address : Setup from the weird remote controller
   ∗ It is temporarily necessary to set the indoor unit and wired to 1 : 1.
   (In group operation and in time without remote controller)

Automatic Address Setup

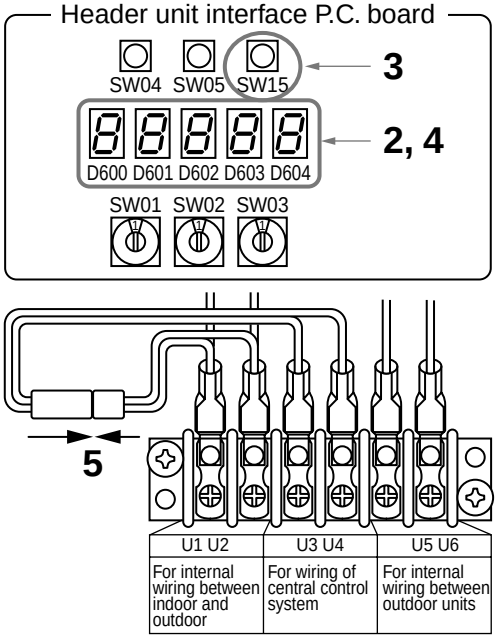
Without central control : To the address setup procedure 1
With central control : To the address setup procedure 2

(However, go to the procedure 1 when the central control is performed in a single refrigerant line.)

(Example)	In case of central control in a single refrigerant line	In case of central control over refrigerant lines
Address setup procedure	To procedure 1	To procedure 2
Cable systematic diagram		

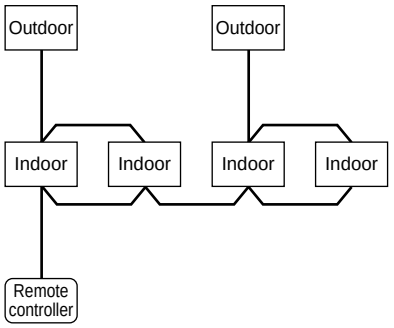
Address setup procedure 1

1. Turn on power of indoor/outdoor units.
   (In order of indoor → Outdoor)
2. After approx. 1 minute, check that U. 1. L08 (U. 1. flash) is displayed in 7-segment display section on the interface P.C. board of the header unit.
3. Push SW15 and start setup the automatic address.
   (Max. 10 minutes for 1 line (Usually, approx. 5 minutes))
4. When the count Auto 1 → Auto 2 → Auto 3 is displayed in 7-segment display section, and it changes from U. 1. - - - (U. 1. flash) to U. 1. - - - (U. 1. light), the setup finished.
5. **When perform a central control, connect a relay connector between [U1, U2] and [U3, U4] terminals in the header unit.**



REQUIREMENT

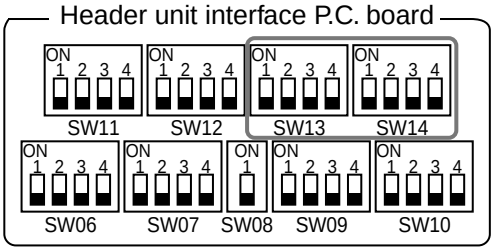
- When a group control is performed over the multiple refrigerant lines, be sure to turn on the power supplies of all the indoor units connected in a group in the time of address setup.
- If turning on the power for each refrigerant line to set up address, a header indoor unit is set for each line. Therefore, an alarm code “L03” (Duplicated indoor header units) is output in operation after address setup. In this case, change the group address from the wired remote controller for only one header unit is set up.

(Example)	Group control over multiple refrigerant lines
Cabling systematic diagram	

Address setup procedure 2

1. Using SW13 and 14 on the interface P.C. board of the header unit in each system, set up the refrigerant line address for each system.
   (At shipment from factory: Set to Address 1)

Note) Be careful not to duplicate with other refrigerant line.



System address switch on outdoor interface P.C. board

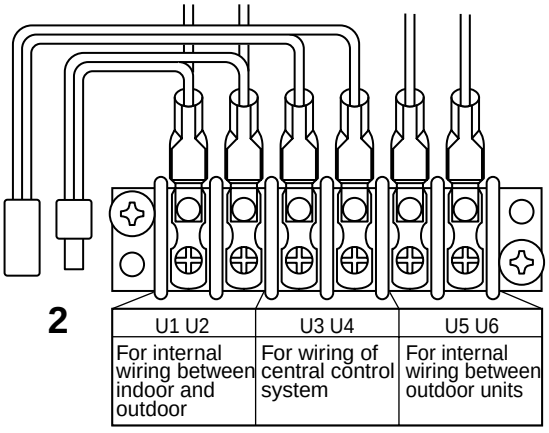
(○: Switch ON, ×: Switch OFF)

System address	SW13				SW14			
	1	2	3	4	1	2	3	4
1	×	×	×	×	×	×	×	×
2	×	×	×	×	○	×	×	×
3	×	×	×	×	×	○	×	×
4	×	×	×	×	○	○	×	×
5	×	×	×	×	×	×	○	×
6	×	×	×	×	○	×	○	×
7	×	×	×	×	×	○	○	×
8	×	×	×	×	○	○	○	×
9	×	×	×	×	×	×	×	○
10	×	×	×	×	○	×	×	○
11	×	×	×	×	×	○	×	○
12	×	×	×	×	○	○	×	○
13	×	×	×	×	×	×	○	○
14	×	×	×	×	○	×	○	○

System address	SW13				SW14			
	1	2	3	4	1	2	3	4
15	×	×	×	×	×	○	○	○
16	×	×	×	×	○	○	○	○
17	×	×	×	○	×	×	×	×
18	×	×	×	○	○	×	×	×
19	×	×	×	○	×	○	×	×
20	×	×	×	○	○	○	×	×
21	×	×	×	○	×	×	○	×
22	×	×	×	○	○	×	○	×
23	×	×	×	○	×	○	○	×
24	×	×	×	○	○	○	○	×
25	×	×	×	○	×	×	×	○
26	×	×	×	○	○	×	×	○
27	×	×	×	○	×	○	×	○
28	×	×	×	○	○	○	×	○

: Is not used for setup of system address. (Do not change setup.)

2. Check that the relay connectors between [U1U2] and [U3U4] terminals are come out in all the header units to which the central control is connected.
   (At shipment from factory: No connection of connector)
3. Turn on power of indoor/outdoor.
   (In order of indoor → outdoor)
4. After approx. 1 minute, check that 7-segment display is U.1.L08 (U.1. flash) on the interface P.C. board of the header unit.
5. **Push SW15 and start setup the automatic address.**
   (Max. 10 minutes for 1 line (Usually, approx. 5 minutes))
6. When the count Auto 1 → Auto 2 → Auto 3 is displayed in 7-segment display section, and it changes from U. 1. - - - (U. 1. flash) to U. 1. - - - (U. 1. light) , the setup finished.
7. Procedure 4. to 6. are repeated in other refrigerant lines.

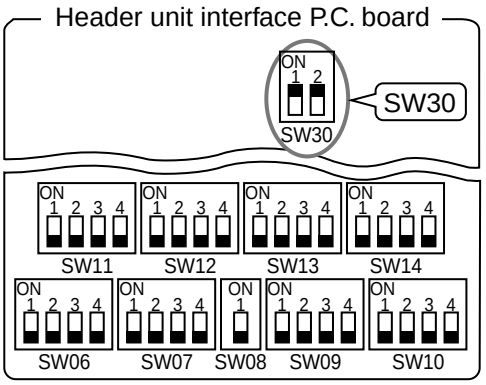


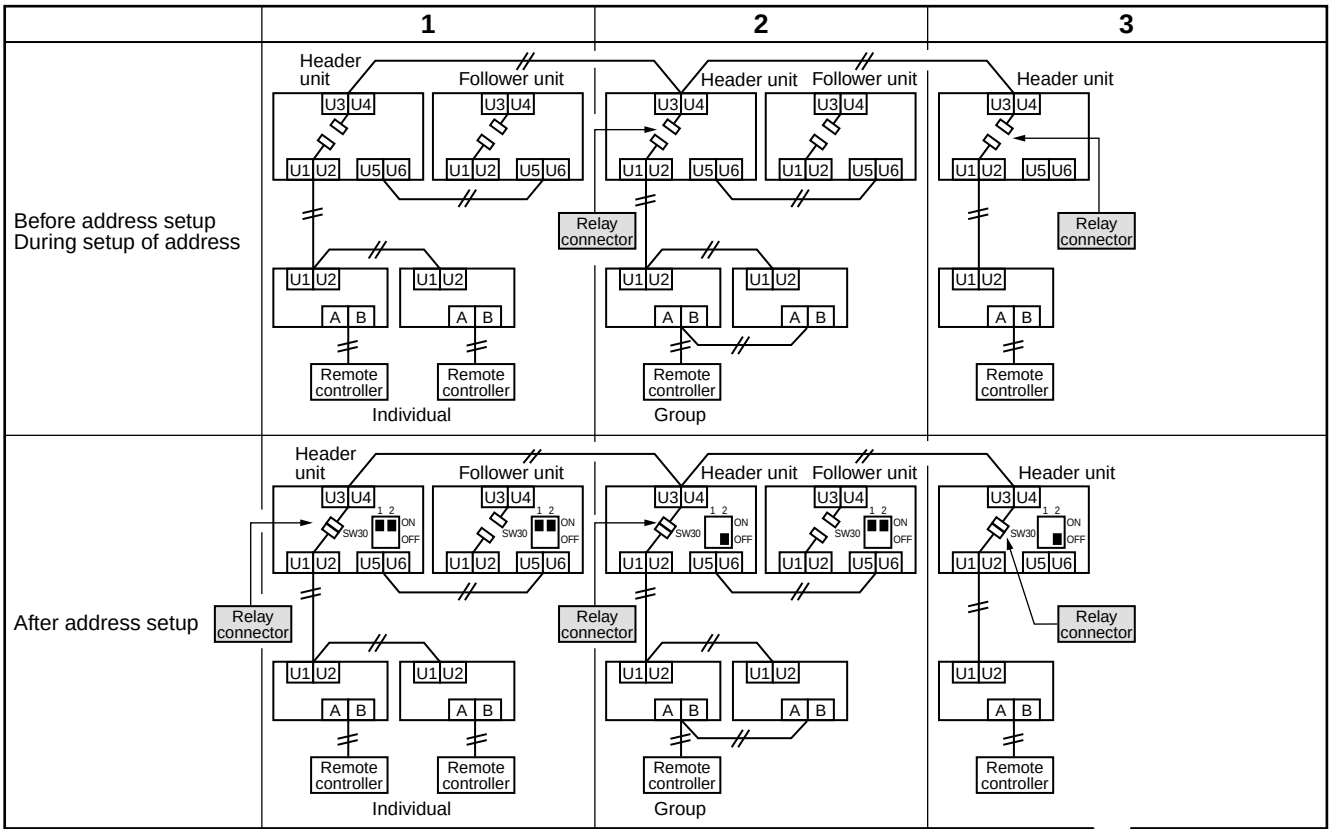
8. How to set up resistance of the end terminal

   When all the address setups have finished in the same refrigerant circuit system, put the resistance of the end terminals in the same central control line into one.

   - Remain only SW30-2 of the header outdoor unit with the least refrigerant line address number as it is ON. (With end terminal resistance)
   - Set up SW30-2 of the other header outdoor units to OFF. (Without end terminal resistance)

9. Connect the relay connector between [U1U2] and [U3U4] of the header unit for each refrigerant line.
10. Then set up the central control address.
    (For the central control address setup, refer to the Installation manual of the central control devices.)





Outdoor interface P.C. board	Header unit	Follower unit	Header unit	Follower unit	Header unit	Setup at shipment from factory
SW13, 14 (Refrigerant line address)	1	(Setup is unnecessary.)	**2**	(Setup is unnecessary.)	**3**	1
SW30-2 Terminal-end resistance of indoor/outdoor communi cation line/central control communication line	ON	(Setup is unnecessary.)	**OFF after address setup**	(Setup is unnecessary.)	**OFF after address setup**	ON
Relay connector	**Connect short after address setup**	Open	Connect short after address setup	Open	**Connect short after address setup**	Open

Indoor side (Automatic setup)

Refrigerant line address	1	1	2	2	3
Indoor unit address	1	2	1	2	1
Group address	0	0	1	2	0

Point

Relay connector **— NOTE —**

Never connect a relay connector until address setup for all the refrigerant lines finishes; otherwise address cannot be correctly set up.

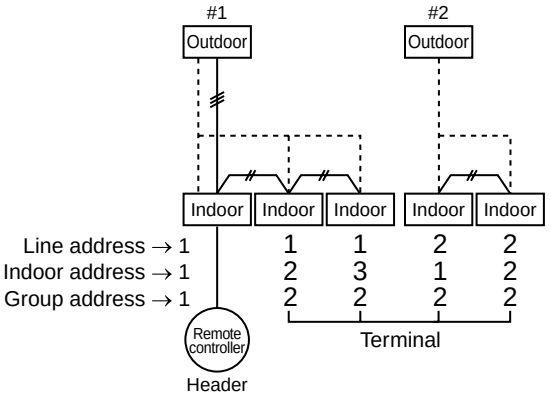
Manual address setup from remote controller

In case to decide an address of the indoor unit prior to finish of indoor cabling work and unpracticed outdoor cabling work (Manual setup from remote controller)

Arrange one indoor unit and one remote controller set to 1 by 1.

Turn on the power.

(Wiring example in 2 lines)



In the above example, under condition of no jump wire of the remote controller, set the address after individual connecting of the wired remote controller.

Group address

Individual : 0000
Center unit : 0001
Terminal unit : 0002
} In case of group control

1 **Push simultaneously SET + CL + 🔧 buttons for 4 seconds or more.**
LCD changes to flashing.

(Refrigerant line address)

2 **Using the setup temp. ▲ / ▼ buttons, set 12 to the item code.**

3 **Using the timer time ▲ / ▼ buttons, set up the line address.**
(Match it with the line address on the interface P.C. board of the header unit in the identical refrigerant line.)

4 **Push SET button.**
(OK when display goes on.)

(Indoor address)

5 **Using the setup temp. ▲ / ▼ buttons, set 13 to the item code.**

6 **Using the timer time ▲ / ▼ buttons, set up the indoor address.**

7 **Push SET button.**
(OK when display goes on.)

(Group address)

8 **Using the setup temp. ▲ / ▼ buttons, set 14 to the item code.**

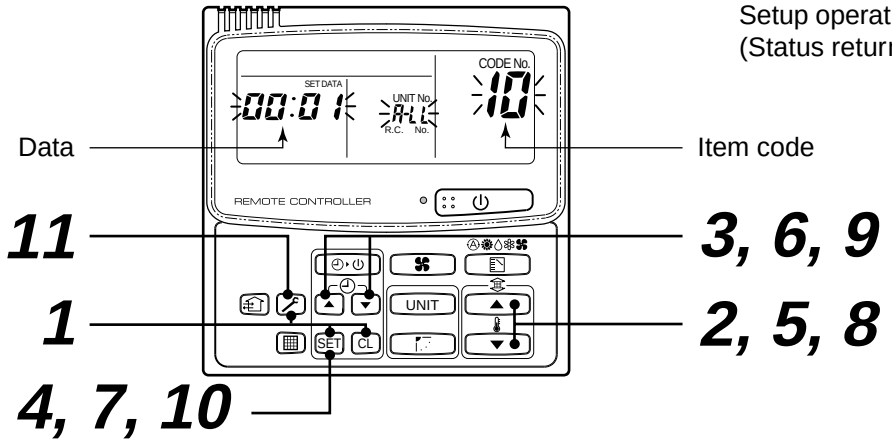
9 **Using the timer time ▲ / ▼ buttons, set Individual = 0000, Header unit = 0001, Follower unit = 0002.**

10 **Push SET button.**
(OK when display goes on.)

11 **Push 🔧 button.**
Setup operation finished.
(Status returns to normal stop status.)

Operation procedure

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** →
7 → ***8*** → ***9*** → ***10*** → ***11*** **End**



Note 1)

When setting the line address from the remote controller, do not use address 29 and 30.

The address 29 and 30 cannot be set up in the outdoor unit. Therefore if they are incorrectly set up, a check code [E04] (Indoor/outdoor communication circuit error) is output.

Confirmation of indoor unit address and position by using the remote controller

[Confirmation of indoor unit address and the position]

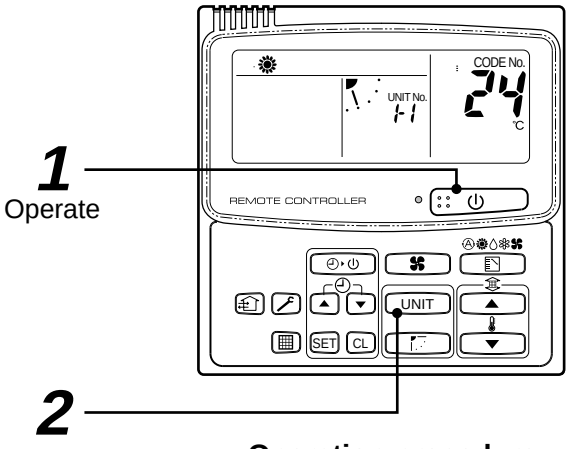
1. When you want to know the indoor address though position of the indoor unit itself can be recognized;

<Procedure> (Operation while the air conditioner operates)

1 **If it stops, push [⏻] button.**

2 **Push [UNIT] button.**

The unit NO 1-1 is displayed on the LCD. (Disappears after several seconds) The displayed unit No indicates the line address and indoor address. (If there is other indoor unit connected to the same remote controller (Group control unit), other unit No is displayed every pushing [UNIT] button.)



Operation procedure

1 → 2

2. When you want to know position of the indoor unit using the address

- To confirm the unit numbers in a group control;

<Procedure> (Operation while the air conditioner stops)

The indoor unit numbers in a group control are successively displayed, and the corresponding indoor fan is turned on. (Operation while the air conditioner stops)

1 **Push [🏠] + [🔧] buttons simultaneously for 4 seconds or more.**

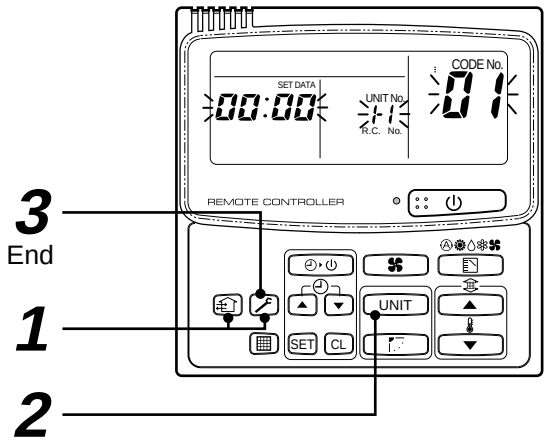
- Unit No ALL is displayed.
- The fans of all the indoor units in a group control are turned on.

2 **Every pushing [UNIT] button, the indoor unit numbers in the group control are successively displayed.**

- The firstly displayed unit No indicates the address of the header unit.
- Only fan of the selected indoor unit is turned on.

3 **Push [🔧] button to finish the procedure.**

All the indoor units in group control stop.



Operation procedure

1 → 2 → 3 **End**

• **To confirm all the unit numbers from an arbitrary wired remote controller;**

<Procedure> (Operation while the air conditioner stops)

The indoor unit No and position in the same refrigerant piping can be confirmed. An outdoor unit is selected, the indoor unit numbers in the same refrigerant piping are successively displayed, and then its indoor unit fan is turned on.

1 **Push the timer time ▼ + wrench buttons simultaneously for 4 seconds or more.**
Firstly, the line 1, **item code** AC (Address Change) is displayed. (Select outdoor unit.)

2 **Using UNIT + ⚐ buttons, select the line address.**

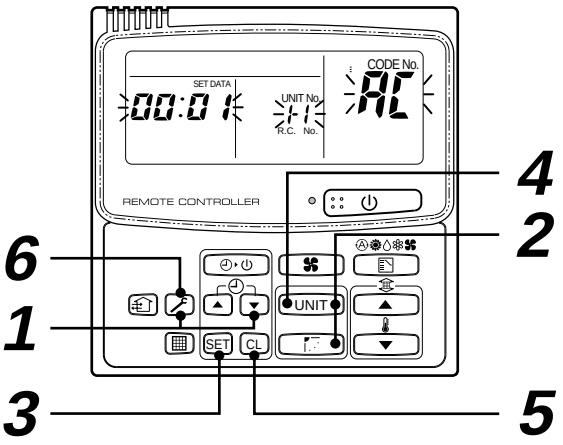
3 **Using SET button, determine the selected line address.**
- The indoor unit address, which is connected to the refrigerant pipe of the selected outdoor unit is displayed and the fan is turned on.

4 **Every pushing UNIT button, the indoor unit numbers in the identical pipe are successively displayed.**
- Only fan of the selected indoor unit operates.

[To select another line address]

5 **Push CL button to return to procedure *2*).**
- The indoor address of another line can be successively confirmed.

6 **Push wrench button to finish the procedure.**



Operation procedure

1 → ***2*** → ***3*** →
4 → ***5*** → ***6*** **End**

Change of indoor address from remote controller

Change of indoor address from wired remote controller

• **To change the indoor address in individual operation (Wired remote controller : Indoor unit = 1 : 1) or group control** (When the setup operation with automatic address has finished, this change is available.)

<Procedure> (Operation while air conditioner stops)

1 **Push simultaneously SET + CL + wrench buttons for 4 seconds or more.**
(The firstly displayed unit No indicates the header unit in group control.)

2 **In group control, select an indoor unit No to be changed by UNIT button.**
(The fan of the selected indoor unit is turned on.)

3 **Using the setup temp. ▲ / ▼ buttons, set *13* to the item code.**

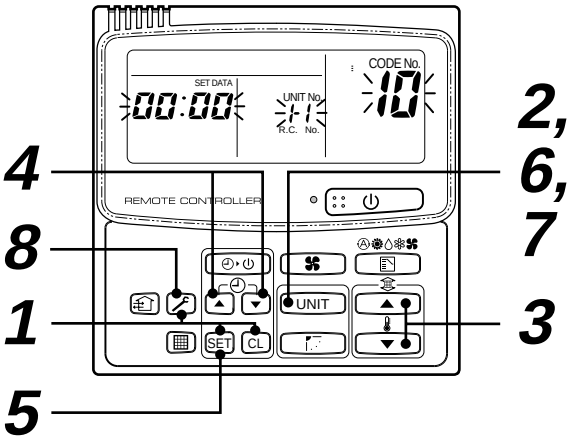
4 **Using the timer time ▲ / ▼ buttons, change the displayed setup data to a data which you want to change.**

5 **Push SET button.**

6 **Using the UNIT button, select the unit No. to be changed at the next time. Repeat the procedure *4* to *6* and change the indoor address so that it is not duplicated.**

7 **After the above change, push UNIT button to confirm the changed contents.**

8 **If it is acceptable, push wrench button to finish confirmation.**



Operation procedure

1 → ***2*** → ***3*** → ***4*** →
5 → ***6*** → ***7*** → ***8*** **End**

- **To change all the indoor addresses from an arbitrary wired remote controller;**
  (When the setup operation with automatic address has finished, this change is available.)

Contents : Using an arbitrary wired remote controller, the indoor unit address can be changed for each same refrigerant piping line

∗ **Change the address in the address check/change mode.**

<Procedure> (Operation while air conditioner stops)

1 **Push the timer time ▼ + 🔧 buttons simultaneously for 4 seconds or more.**
Firstly, the line 1, **item code** AC (Address Change) is displayed.

2 **Using UNIT + ⊞ buttons, select the line address.**

3 **Push SET button.**
- The indoor unit address, which is connected to the refrigerant pipe of the selected outdoor unit is displayed and the fan is turned on.
  First the current indoor address is displayed on the setup data. (Line address is not displayed.)

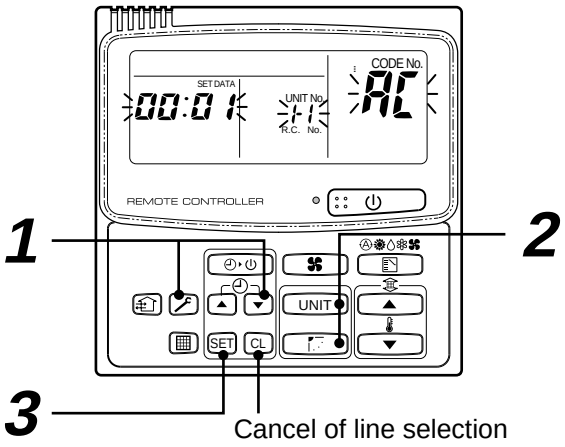
4 **The indoor address of the setup data moves up/down by the timer time ▲ / ▼ buttons.**
Change the setup data to a new address.

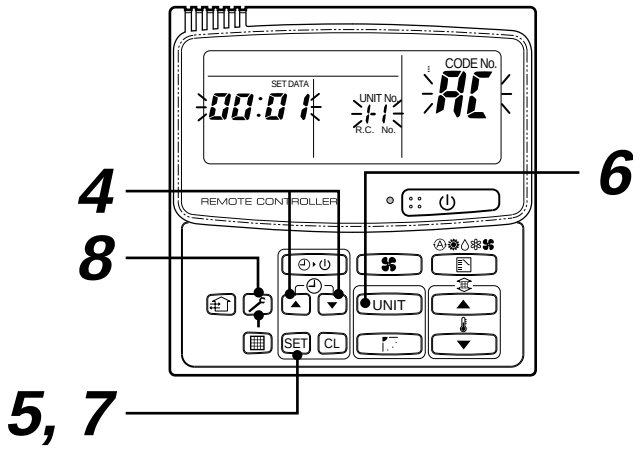
5 **Push SET button to determine the setup data.**

6 **Every pushing UNIT button, the indoor unit numbers in the identical pipe are successively displayed. Only fan of the selected indoor unit operates.**
Repeat the procedure ***4*** to ***6*** and change all the indoor addresses so that they are not duplicated.

7 **Push SET button.**
(All the displays on LCD go on.)

8 **Push 🔧 button to finish the procedure.**





Here, if the unit No is not called up, the outdoor unit in this line does not exist.

Push CL button, and then select a line according to procedure ***2***.

Operation procedure

1 → ***2*** → ***3*** → ***4*** →
5 → ***6*** → ***7*** → ***8*** **End**

Clearance of address (Return to status (Address undecided) at shipment from factory)

Method 1

An address is individually cleared from a wired remote controller.

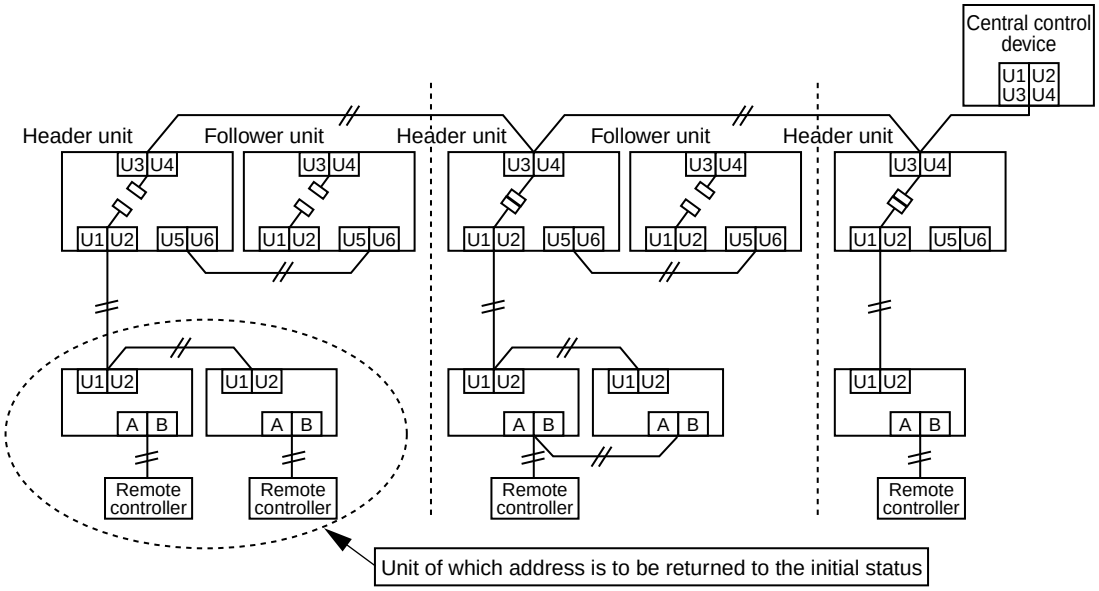
"0099" is set up to line address, indoor address, and group address data from the remote controller.

(For the setup procedure, refer to the abovementioned address setup from the remote controller.)

Method 2

Clear the indoor addresses in the same refrigerant line from the outdoor unit.

1. Turn off the power of the refrigerant line to be returned to the status at shipment, and change the header unit to the following status.
   1) Remove the relay connector between [U1U2] and [U3U4].
      (If it has been already removed, leave it as it is.)
   2) Turn on SW30-2 on the interface P.C. board of the header unit if it is OFF.
      (If it has been already ON, leave it as it is.)



2. Turn on the indoor/outdoor power of which address is to be cleared. After approx. 1 minute, check that "U.1. - - -" is displayed, and then execute the following operation on the interface P.C. board of the header unit of which address is to be cleared in the refrigerant line.

SW01	SW02	SW03	SW04	Address which can be cleared
2	1	2	After checking that "A.d.buS" is displayed on 7-degment display, and then push SW04 for 5 seconds or more.	Line + Indoor + Group address
2	2	2	After checking that "A.d.nEt" is displayed on 7-degment display, and then push SW04 for 5 seconds or more.	Central address

3. After "A.d. c.L." has been displayed on 7-degment display, return SW01/SW02/SW03 to 1/1/1.
4. When the address clearing has correctly finished, "U.1.L08" is displayed on 7-degment display after a while. If "A.d. n.G." is displayed on 7-degment display, there is a possibility which is connected with the other refrigerant line. Check again the relay connector between [U1U2] and [U3U4] terminals.

   NOTE) Be careful that the other refrigerant line address may be also cleared if clearing operation is not correctly executed.
5. After clearing of the address, set up an address again.

In case of increase the address-undefined indoor units (Extension, etc.)

If set up the indoor address of which address is undefined accompanied with extension of indoor units, replacement of P.C. board, etc, follow to the methods below.

Method 1

Set up an address individually from a wired remote controller.

(Line address, Indoor address, Group address, Central address)

For the setup method, refer to the above “Manual address setup from remote controller”.

Method 2

Set up an address from the outdoor unit.

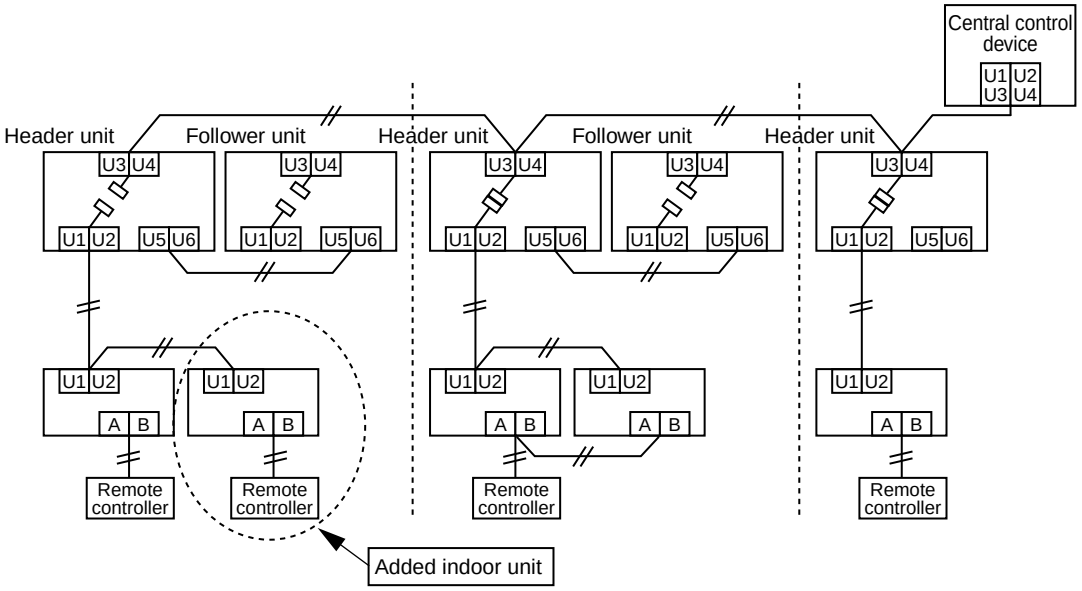
∗ Leave the address of the unit of which address has been already set up as it is.
Set up an address only to the unit of which address is undefined.

The addresses are allocated from the low number.

Setup procedure

Arrange the outdoor header units in the refrigerant line to which indoor units are added. (Figure below)

1. Remove the relay connector between [U1U2] and [U3U4].
2. Turn on SW30-2 on the interface P.C. board at outdoor header unit side if it is OFF.
   ∗ Turn off the power, and then execute the operation.



3. Turn on the indoor/outdoor power of which address is to be set up. After approx. 1 minute, check that “U.1. - - -” is displayed on 7-segment display.
4. Execute the following operation on the interface P.C. board of the header unit.

SW01	SW02	SW03	SW04
2	14	2	After checking that “In.At” is displayed on 7-segment display, and then push SW04 for 5 seconds or more.

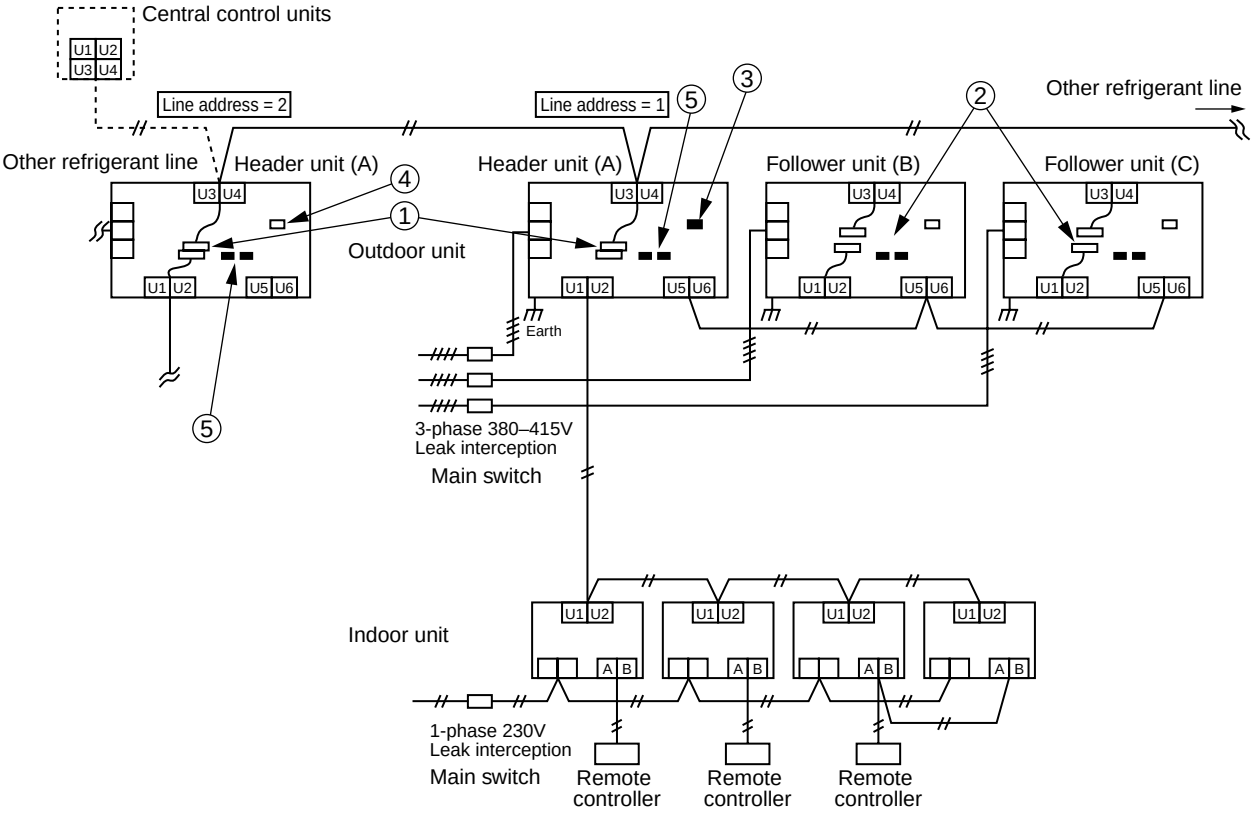
“AUTO1” → “AUTO2” → “AUTO3” → ⋯ → “AUTO9” … is counted and displayed on 7-degment display.

- Return the SW01, 02, 03 setup as before.

5. When “U.1. - - -” is displayed on 7-segment display, the setup operation finished.
   Turn off the indoor/outdoor power.
6. Return the following setup as before.
   - Relay connector
   - SW30-2

8-4-4. Check after Address Setup When Central Control System is Connected

When the central control system is connected, check the following setup has finished after address setup.



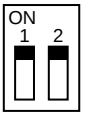
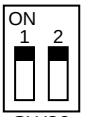
	Main check items	Check
Relay connector	1) Is relay connector of the header unit connected after address setup?	
	2) Is relay connector of the follower unit removed?	
Terminal resistance	3) Is the end resistance (SW30-2) of the header unit with the least refrigerant line address number (in the central control line) turned on? (Setup is unnecessary for follower unit.)	
	4) Are the terminal resistance (SW30-2) of the header units except for the line of which central control refrigerant line address is the smallest, turned off? (Setup is unnecessary for follower unit.)	
Line address	5) Are not addresses in the line address (SW13, SW14) duplicated in each refrigerant line?	

NOTE) The above table does not describe all the electric cablings. For details, refer to each installation manual for outdoor unit, indoor unit, remote controller, and optional devices.

8-5. Troubleshooting in Test Operation

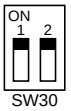
If the phenomena appear, such as a check code is output or the remote controller is not accepted in power-ON after cabling work or in address setup operation, the following causes are considered.

8-5-1. A check Code is Displayed on the Remote Controller

Check code displayed on remote controller	Center unit 7-segment display	Cause	Countermeasures
E04	E19-00	Outdoor power is formerly turned on.	Turn on the power again. (In order of Indoor → Outdoor)
		There is none of outdoor terminal resistance, or there are two or more resistances. (After address setup)	Check SW30 bit 2 of the header unit. No connection between multiple refrigerant lines: SW30 bit 20N Connection between multiple refrigerant lines: SW30 bit 2 of the connected header unit is turned on only in one line.
		After address was decided, all the indoor units do not correctly response after power-ON in outdoor unit.  SW30	Check and modifies disconnection of indoor/outdoor communication line.(Communication line between center unit and the leading indoor unit) Check influence of communication noise.
	L08	Address setup error • Only line addresses of the connected indoor units are undefined. • The outdoor line address and the line addresses in all indoor units do not match. • The indoor addresses are duplicated. (Units except those displaying E04 are duplicated.) • A header unit is not set up in a group. (Except group displaying E04)	Set up address again.
	E08-XX	Duplication of indoor addresses. (Address No in which sub-code of the check code are duplicated)	Set up address again.
	E07	There is none of outdoor terminal resistance, or there are two or more resistances. (After address setup, when terminal resistance setup is changed after power-ON.)  SW30	Check SW30 bit 2 of the header unit. No connection between multiple refrigerant lines: SW30 bit 20N Connection between multiple refrigerant lines: SW30 bit 2 of the connected header unit is turned on only in one line.
		Transmission circuit error at interface side (P.C. board failure)	Replace the interface P.C. board.
	E06	After address setup, communication from all the indoor units interrupted under condition that a normal operation can be performed.	Check and correct disconnection of indoor/outdoor communication line.(Communication line between header unit and the leading indoor unit) Check influence of communication noise.
E16	E16-XX	Exceeded No of connected indoor units or exceeded capacity.	Adjust No of connected indoor units or capacity.
E25	E25	Duplication of outdoor addresses. (Only when outdoor address was manually set up)	Do not use a manual setup for outdoor address.
E26	E26-XX	No. of connected outdoor units decreased. • When setting outdoor backup • The power of follower unit is not turned on.	Correct of cause of error occurrence • If it occurred when setting backup, clear the error after setup finish. • If the power of follower unit is not turned on, turn on the power.
L04	L04	Duplication of outdoor line addresses • Line address setup error, occurred after connection between U_1, U_2 and U_3, U_4 connectors	Modify line address setup of the header unit between lines. (Set up SW 13 and 14 on the interface P.C. board.)
L05 (*)	L06	Duplicated of indoor units with priority	Set up priority to only one indoor unit.
L06		There are two or more indoor units set up with priority.	
L08	L08	Address setup error • Only indoor addresses of all the connected indoor units are undefined.	Set up address again.

(*) [L05]: Displayed on the indoor unit set up with priority
[L06]: Displayed on the indoor unit except one set up with priority

8-5-2. Operation from remote controller is not accepted and a check code is displayed on 7-segment display of the interface P.C. board of the header unit.

Remote controller status	7-segment display of center unit	Cause	Countermeasures
No response	L08	Line addresses and indoor addresses of all the connected indoor units are unset.	Set up addresses.
		There is no header unit of group control.	Set up group address.
	E19-00	Indoor unit power is not turned on.	Turn on the power again. (In order of indoor → outdoor)
		Indoor/outdoor communication line is not correctly connected to the header unit. (Fig. 1) (Indoor/outdoor cannot communicate before address setup.)  SW30	Correct cabling.
		There is none of outdoor terminal resistance, or there are two or more resistances. (Before address setup)	Check SW30 bit 2 of the header unit. No connection between multiple refrigerant lines: SW30 bit 2 0N Connection between multiple refrigerant lines: SW30 bit 2 of the connected header unit is turned on only in one line.
	E19-02	When connecting indoor/outdoor communication line between outdoor units under condition of connected communication line between outdoor units (Fig. 2)	Correct cabling.
		SW08 setup error	Turn all SW08 to OFF side.
	E20-01	Address setup is performed with connecting indoor/outdoor communication line between outdoor units. (Fig. 3)	Correct cabling.
		Address setup is performed under condition of connecting between multiple refrigerant lines. (Fig. 3)	Correct cabling.

8-5-3. There is no display of a check code on 7-segment display on the interface P.C. board of the header unit though there is indoor unit which does not accept the operation from the remote controller.

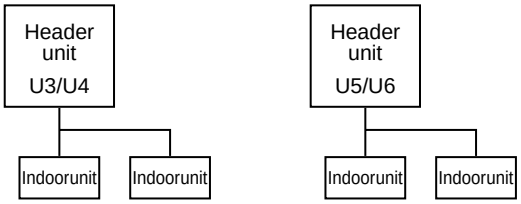
Remote controller status	7-segment display of center unit	Cause	Countermeasures
No response	None	Communication line is not connected between indoor and outdoor.	Modify cabling.
		Line and indoor addresses are unset. (Unit which does not response to remote controller)	Set up address.
		The power of the header unit of the group is not turned on in indoor group control.(Unit which does not response to remote controller)	Turn on the power.
		Group address is set up to follower unit in the individual control. (Unit which does not response to remote controller)	Set [0] to group address in case of individual control.
No display on remote controller (No line is output.)	None	The power is not turned on. (Unit which is not displayed on remote controller)	Turn on the power.
		Remote controller is not connected with cable. (Unit which is not displayed on remote controller)	Correct cabling.
		Miscabling of remote controller (Unit which is not displayed on remote controller)	Correct cabling.
		Remote controller communication circuit error (Unit which is not displayed on remote controller) If 230V is incorrectly applied to the remote controller terminal, the remote controller communication circuit fails.	Remove FASTON terminal connected to remote controller terminals (A/B), and check the voltage. If voltage is not applied, replace P.C. board. (15 to 18V usually)

8-5-4. In check for No. of connected outdoor units and connected Indoor units after address setup, diminished No. of connected units displayed. (There are outdoor/indoor units which do not operate in a test operation.)

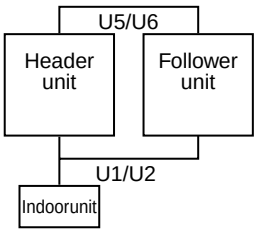
Status	Cause	Countermeasures
Number of connected outdoor units is short.	Miswiring of communication line between outdoor units or unconnected cable (Fig. 4) (Address setup operation has finished without recognition of miswired follower unit.)	After modification of wiring, set up address again and check No. of the connected outdoor units.
Number of connected indoor units is short.	Miswiring of communication line between indoor units or unconnected cable (Fig. 5) (Address setup operation has finished without recognition of miswired indoor unit.)	After modification of wiring, set up address again and check No. of the connected indoor units.
Number of outdoor units connected to group is short in group operation from remote controller.	Remote controller is not connected with cable. Miscabling of remote controller	Using the main remote controller connected to a group, start a test operation, specify the unit which does not operate (Unit unconnected to group), and then check cabling.
	Remote controller communication circuit error If 230V is incorrectly applied to the remote controller terminal, the remote controller communication circuit fails.	Using the main remote controller connected to a group, start a test operation, specify the unit which does not operate (Unit unconnected to group). Remove Fasten receptacle connected to remote controller terminals (A/B), and check the voltage. If voltage is not applied, replace P.C. board. (15 to18V in normal time)

<Miswiring example>

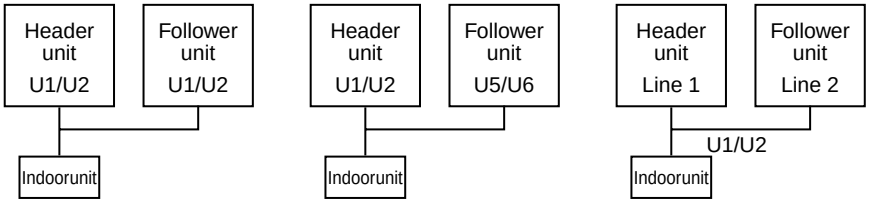
(Fig. 1)

Remote controller status	Header unit 7-segment display	Miswiring example
No response	E19-00	

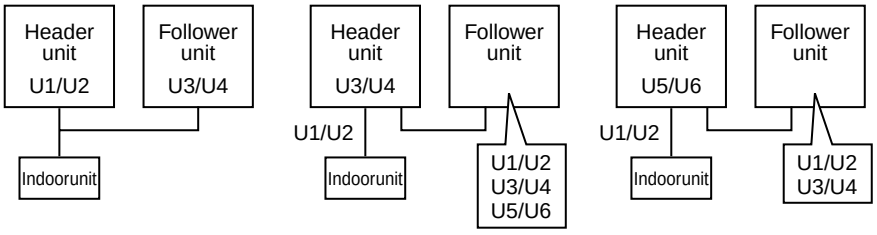
(Fig. 2)

Remote controller status	Header unit 7-segment display	Miswiring example
No response	E19-02	

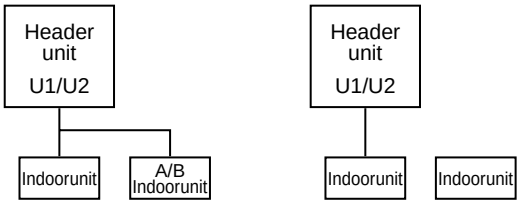
(Fig. 3)

Remote controller status	Header unit 7-segment display	Miswiring example
No response	E20-01	

(Fig. 4)

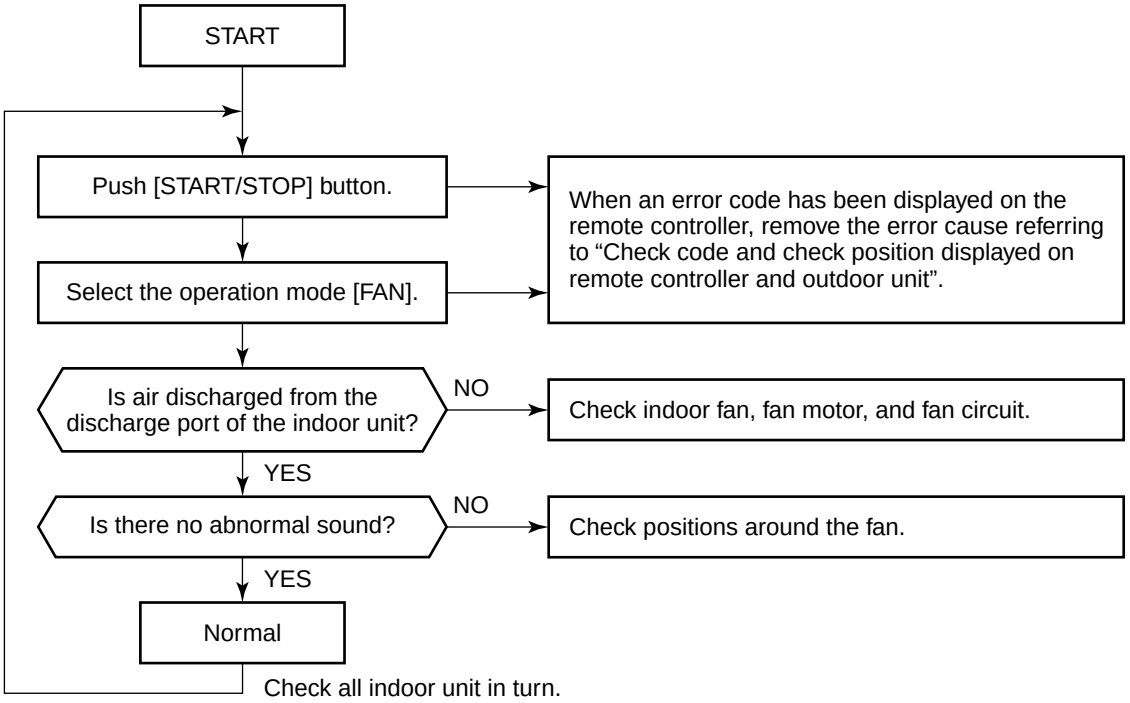
Status	Miswiring example
Number of connected outdoor units is short.	

(Fig. 5)

Status	Miswiring example
Number of connected outdoor units is short.	

8-6. Test Operation Check

8-6-1. Fan Check



8-6-2. Cooling/Heating Test Operation Check

The cooling/heating test operation check can be performed on both remote controller and outdoor interface P.C. board.

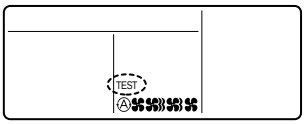
1. Test operation start/stop operation

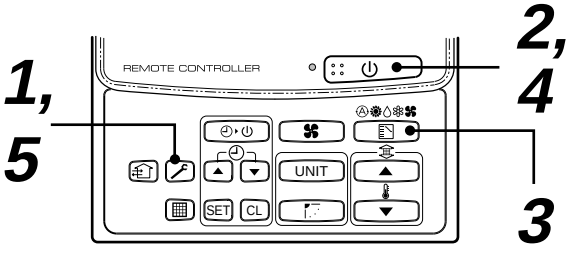
<Test operation from remote controller>

Wired remote controller : Refer to the lower items in “Test operation” of wired remote controller.
Wireless remote controller : Refer to the lower items in “Test operation” of wireless remote controller.

Wired remote controller

1 **When pushing [wrench] button for 4 seconds or more, [TEST] is displayed in the display section and the mode enters in test operation mode.**

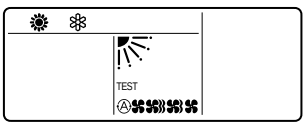




2 **Push [power] button.**

3 **Using [mode] button, select an operation mode [COOL] or [HEAT].**

- Do not use operation mode other than [COOL] or [HEAT].
- Temperature adjustment is unavailable during test operation.
- Error is detected as usual.



4 **When the test operation has finished, push [power] button to stop the operation.**
(The same display as that in procedure 1) appears in the display section.)

5 **Push [wrench] button to clear the test operation mode.**
([TEST] display in the display section disappears and the status returns to the normal stop status.)



Wireless remote controller (Except 4-way Air Discharge Cassette type and Under Ceiling type)

1 Remove a screw which fixes the serial plate of the receiver part on the wireless remote controller.

Remove the nameplate of the receiver section by inserting a minus screwdriver, etc into the notch at the bottom of the plate, and set the Dip switch to [TEST RUN ON].

2 Execute a test operation with button on the wireless remote controller.

- (), (), and LED flash during test operation.
- Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is invalid.

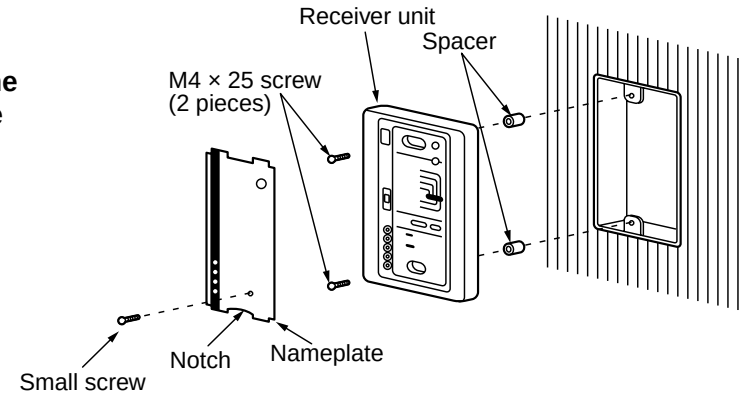
Do not use this method in the operation other than test operation because the equipment is damaged.

3 Use either COOL or HEAT operation mode for a test operation.

* The outdoor unit does not operate approx. 3 minutes after power-ON and operation stop.

4 After the test operation finished, stop the air conditioner from the wireless remote controller, and return Dip switch of the sensor section as before.

(A 60-minutes timer clearing function is attached to the sensor section in order to prevent a continuous test operation.)



Wireless remote controller (4-way Air Discharge Cassette type)

1 Turn off power of the air conditioner.

Remove the adjust corner cap attached with sensor section from the ceiling panel. For removing method, follow to the installation manual attached to the ceiling panel.
(Be careful to handle the sensor section because cables are connected to the sensor section.)

Remove the sensor cover from the adjust corner cap. (1 screw)

2 Change Bit [1: TEST] of the switch [S003] on the sensor P.C. board from OFF to ON.

Mount the sensor cover and attach the adjust corner cap with sensors to the ceiling panel.

Turn on power of the air conditioner.

3 Push button of the wireless remote controller, and select an operation mode [COOL] or [HEAT] with button. (All the display lamps of the wireless remote controller sensor section flash during the test operation.)

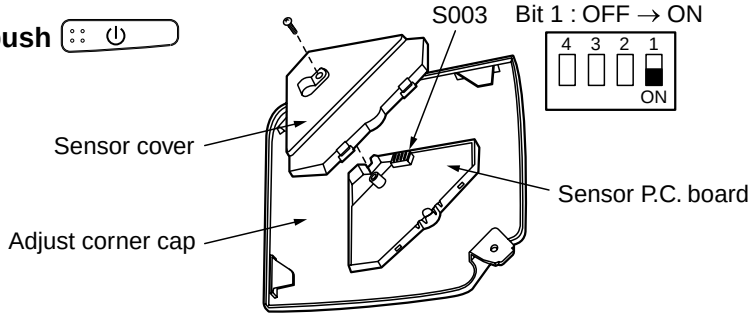
- Do not use operation mode other than [COOL] or [HEAT].
- Error is detected as usual.

4 When the test operation has finished, push button to stop the operation.

5 Turn off power of the air conditioner.

Change Bit [1] of the switch [S003] on the sensor P.C. board from ON to OFF.

Attach the adjust corner cap with sensors to the ceiling panel.



<Test operation from outdoor unit>

Refer to "**8-7-2. Function of Start/Stop the Indoor Unit from Outdoor Unit**" in "**8-7. Service Support Function**".

NOTE) The test operation returns to the normal operation after 60 minutes have passed.

In case of wireless remote controller

Procedure	Description	
1	Turn on power of the air conditioner.	
	The operation is not accepted for 5 minutes when power has been turned on at first time after installation, and 1 minute when power has been turned on at the next time and after. After the specified time has passed, perform a test operation.	
2	Push [**Start/Stop**] button and change the operation mode to [**COOL**] or [**HEAT**] with [**Mode**] button. Then change the fan speed to [**High**] using [**Fan**] button.	
3	**Test cooling operation**	**Test heating operation**
	Set temperature to [18°C] using [**Temperature set**] button.	Set temperature to [30°C] using [**Temperature set**] button.
4	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [19°C]	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [29°C].
5	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [18°C].	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [30°C].
6	Then repeat the procedure ***4*** → ***5*** → ***4*** → ***5***. After approx. 10 seconds, all the display lamps on the sensor part of wireless remote controller, [**Operation**] (Green), [**Timer**] (Green), and [**Ready**] (Yellow) flash and the air conditioner starts operation. If the lamps do not flash, repeat the procedure ***2*** and after.	
7	After the test operation, push [**Start/Stop**] button to stop the operation.	

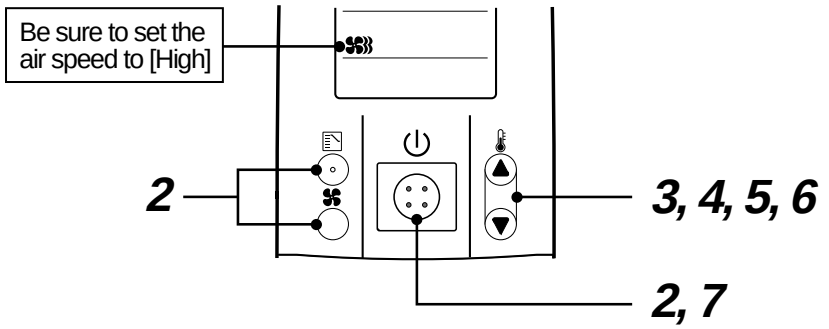
<Outline of test operation from the wireless remote controller>

Test cooling operation:

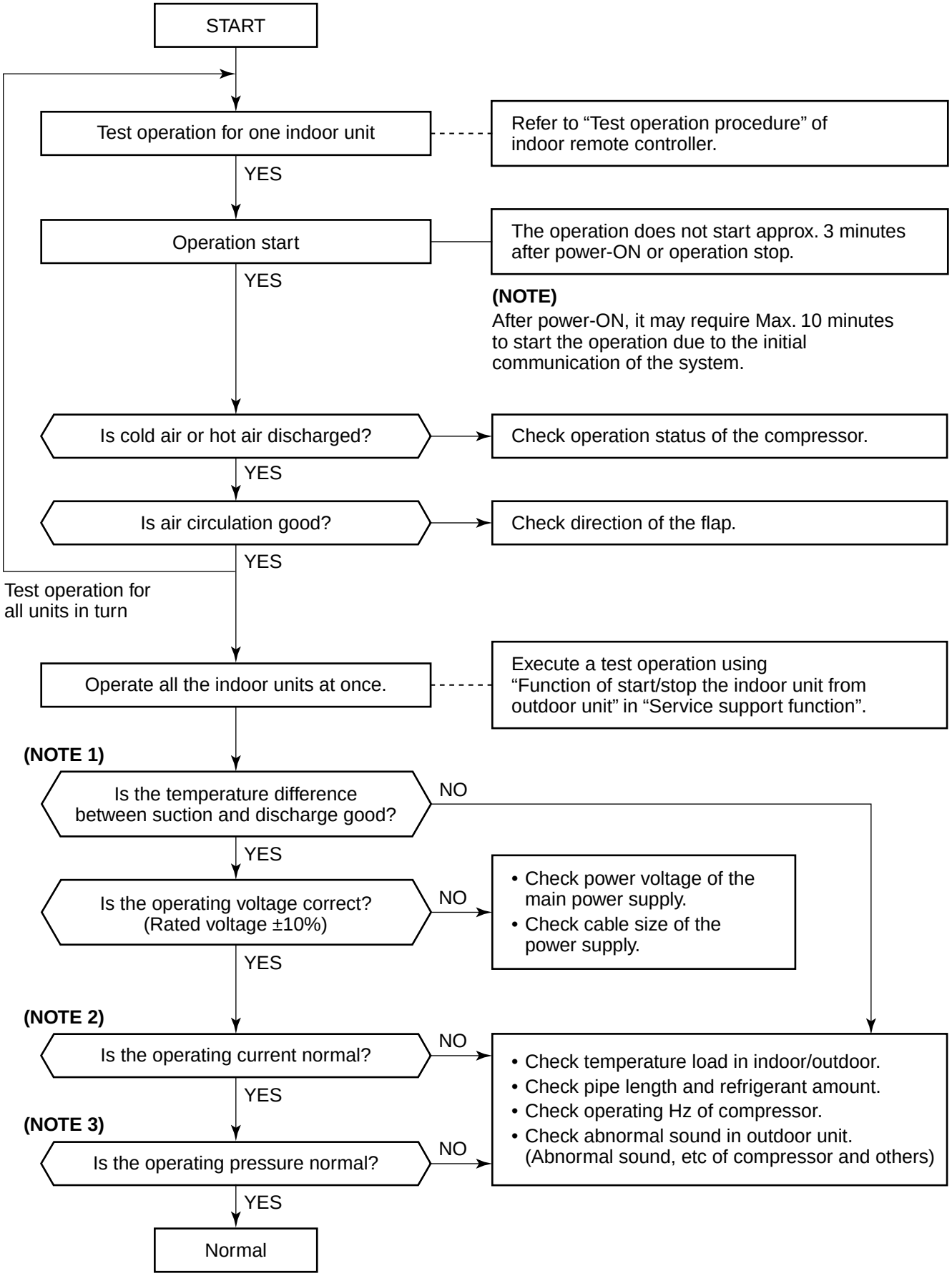
Start → 18°C → 19°C → 18°C → 19°C → 18°C → 19°C → 18°C → (Test operation) → Stop

Test heating operation:

Start → 30°C → 29°C → 30°C → 29°C → 30°C → 29°C → 30°C → (Test operation) → Stop



2. Test operation



(NOTE 1) Criterion for difference between suction and discharge temperature

1. Cooling

   After operation for minimum 30 minutes with [COOL] mode, if there is the dry bulb temperature difference

   Temperature difference: 8°C or more between suction and discharge air of the indoor unit.
   (In Max-Hz operation)

2. Heating

   After operation for minimum 30 minutes with [HEAT] mode, if there is the dry bulb temperature difference
   Temperature difference: 15°C or more between suction and discharge air of the indoor unit.
   (In Max-Hz operation)

   ∗ Consider that the temperature difference temperature difference may diminish in cases of system in which the connected indoor capacity exceeds 100%, a long pipe length, a large difference.

(NOTE 2) Criterion for operating power current

For a test operation (All the indoor units operate), it is normal when the power current is under the following values.

Outdoor unit	5HP	6HP	8HP	10HP	12HP
Current value	14	14	18	21	22

(Unit: A)

(NOTE 3) Criterion for cycle status

1. Refrigerating cycle under standard condition

   The refrigerating cycle under standard cooling and heating condition is as follows:

			10HP MMY-MAP1001H		5HP MMY-MAP0501H	
			Cool standard	**Heat standard**	**Cool standard**	**Heat standard**
Pressure (MPa)	High	(Pd)	3.1	2.9	2.8	2.5
	Low	(Ps)	0.8	0.7	0.9	0.7
Pipe surface temp (°C)	Discharge	(TD)	86	90	84	78
	Suction	(TS1)	6	3	16	6
	Indoor heat exchanger	(TC)	8	46	9	43
	Outdoor heat exchanger	(TE1)	43	1	41	3
	Liquid temp	(TL)	36	36	44	34
Number of compressor rotations (rps)	Compressor	1	79	75	46	49
	Compressor	2	79	75	46	49
Air temp condition (DB/WB) (°C)	Indoor		27/19	20/–	27/19	20/–
	Outdoor		35/–	7/6	35/–	7/6

∗ This compressor is driven with 4-pole motor. The value of the compressor frequency (Hz) measured by a clamp meter is two times of the rotation count (rps) of the compressor.

∗ This data is the cycle data under condition of the standard pipe length and two 4-way Air Discharge Cassette type air conditioners connected. Data changes according to installed pipe length, combination of indoor units, or connected indoor capacity.

∗ For a compressor, the left side is 1 and the right side is 2 viewed from the front side.

Even if two compressors operate, the frequency difference may be a little set as measures against resonance.

∗ The temperature of indoor heat exchanger (TC) indicates TCJ sensor temperature in cooling time, and TC2 sensor temperature in heating time respectively.

2. Criterion for operating pressure

   General criterion is as follows:

Cooling	High pressure : 2.0 to 3.2MPa	Indoor :18 to 32°C	When all the units operate in cooling mode
	Low pressure : 0.5 to 0.9MPa	Outdoor :25 to 35°C	
Heating	High pressure : 2.5 to 3.3MPa	Indoor :15 to 25°C	When all the units operate in heating mode
	Low pressure : 0.5 to 0.7MPa	Outdoor : 5 to 10°C	

Using the rotary switch on the outdoor unit I/F, the operating pressure, cycle temperature, and compressor rotation count can be checked on 7-segment display.

Refer to “Outdoor refrigerant circuit system data display” and “Indoor cycle data display” in Section **9. Troubleshooting**.

8-7. Service Support Function

8-7-1. Check Function for Connecting of Refrigerant and Control Lines

This function is provided to check misconnection of the refrigerant pipes and the control transmission line (Wiring over lines) between indoor unit and outdoor unit by using the switch on the interface P.C. board of the header unit.

However, be sure to check the following items prior to execute this check function.

1. **This check function does not work when a group operation by remote controller is performed and it is used over outdoor units.**
2. **When using this check system, be sure to check for each 1 line in the unit of outdoor unit. If checking the multiple lines at the same time, misjudgment may be caused.**

<Check procedure>

Power ON

Be sure to turn on the power at indoor side before power-ON of outdoor unit.

System capacity check

Set the rotary switch SW01, SW02, and SW03 on the interface P.C. board of the header unit to [1], [2] and [3] respectively. Then the system capacity is displayed on 7-segment display [A]. Check that this display surely matches with the expected system capacity.

(7-segment display)

[A] [B]

[ ] [HP]

↑ System Horse power

Check No. of outdoor units

Set the rotary switch SW01, SW02, and SW03 on the interface P.C. board of the header unit to [1], [3] and [3] respectively. Then No. of outdoor units connected to the system is displayed on 7-segment display [A]. Check that this display surely matches with the expected No. of outdoor units.

(7-segment display)

[A] [B]

[ ] [C]

↑ No. of connected outdoor units

Check No. of indoor units

Set the rotary switch SW01, SW02, and SW03 on the interface P.C. board of the header unit to [1], [4] and [3] respectively. Then No. of indoor units connected to the system is displayed on 7-segment display [A]. Check that this display surely matches with the expected No. of indoor units.

(7-segment display)

[A] [B]

[ ] [P]

↑ No. of connected indoor units

Operation mode setup

According to the indoor temperature, select one of the following items for setup of the rotary switches on the interface P.C. board of the header unit.

Cooling: SW01=[2], SW02=[1], SW03=[1]

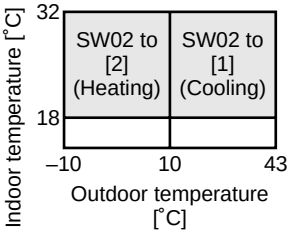
Heating: SW01=[2], SW02=[2], SW03=[1]

(7-segment display)

[A] [B]

Cooling [JC] [ ]

Heating [JH] [ ]



A

A

Operation start

Push the push-switch SW04 on the interface P.C. board of the header unit for 2 seconds or more. The operation starts. Check that cooling is [CC] and heating is [HH] on 7-segment display [B].

(7-segment display)

	[A]	[B]
Cooling	[C]	[CC]
Heating	[H]	[HH]

Operation

Confirmation of check results (1)

Check that No. of misconnected indoor units is displayed on 7-segment display [B] after 15 minutes.
(If there is no misconnection, [00P] is displayed.)

(7-segment display)

[A] [ ] ↑ C or H

[B] [# # P] ↑ No. of misconnected indoor units

This check operation requires 15 minutes even if there is no misconnection or there is any misconnection.

Confirmation of check results (2)

Push the push-switch SW05 on the interface P.C. board of the header unit for 2 seconds or more.
The indoor address in which error is being detected is displayed on 7-segment display [B]. If there are multiple indoor address in which error is being detected, they are successively exchanged and displayed.
(When SW05 is turned on again, the display returns to display of No. of units.)

(7-segment display)

[A] [ ] ↑ C or H

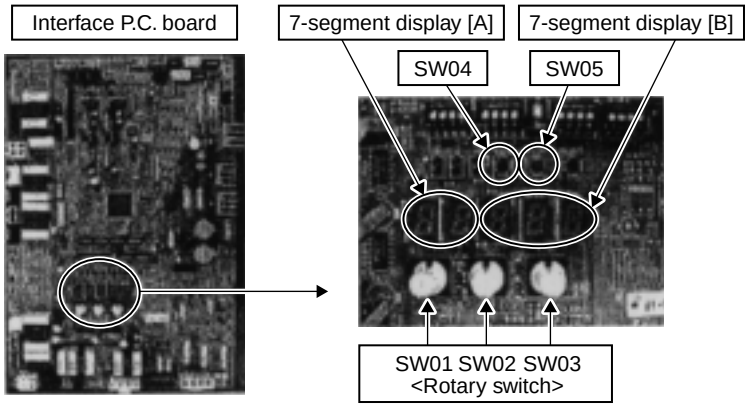
[B] [# #] ↑ Address display of misconnected indoor unit

After check, set each rotary switch SW01, SW02, SW03 to 1/1/1.

(7-segment display)

[A] [U1]

[B] [ ]



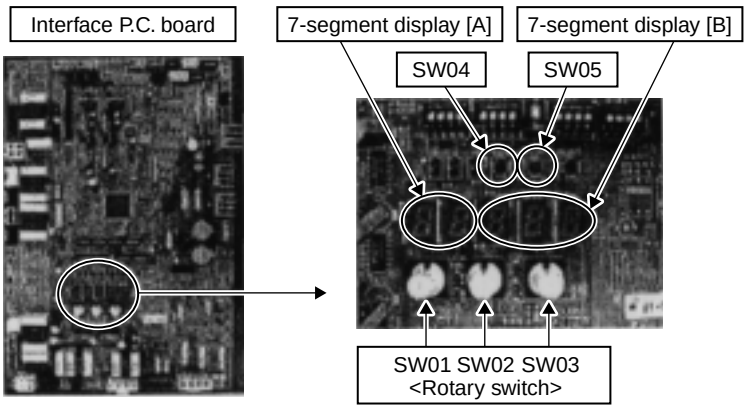
8-7-2. Function to Start/Stop (ON/OFF) Indoor Unit from Outdoor Unit

The following functions of the indoor unit can start or stop by the switches on the interface P.C. board of the header unit.

No.	Function	Outline	Setup/Release	7-segment display
1	Cooling test operation	Changes the mode of all the connected indoor units collectively to cooling test operation. Note) Control operation same as usual test operation from remote control is performed.	[Setup] Push SW04 for 2 seconds or more with SW01"2", SW02"5", SW03"1". [Release] Return SW01, SW02, SW03 to "1".	Section A [C] Section B [–C]
2	Heating test operation	Changes the mode of all the connected indoor units collectively to heating test operation. Note) Control operation same as usual test operation from remote control is performed.	[Setup] Push SW04 for 2 seconds or more with SW01"2", SW02"6", SW03"1". [Release] Return SW01, SW02, SW03 to "1".	Section A [H] Section B [–H]
3	Batch start	Starts all the connected indoor units collectively. Note) The contents follow to the setup of remote controller.	[Setup] Push SW04 for 2 seconds or more with SW01"2", SW02"7", SW03"1". [Release] Return SW01, SW02, SW03 to "1".	Section A [CH] Section B [11] [11] is displayed on Section B for 5 seconds.
	Batch stop	Stops all the connected indoor units collectively.	[Setup] Push SW05 for 2 seconds or more with SW01"2", SW02"7", SW03"1". [Release] Return SW01, SW02, SW03 to "1".	Section A [CH] Section B [00] [00] is displayed on Section B for 5 seconds.
4	Individual start	Starts the specified indoor unit. Notes) • The contents follow to the setup of remote controller. • The other indoor units keep the status as they are.	[Setup] Push SW04 for 2 seconds or more set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be started. [Release] Return SW01, SW02, SW03 to "1".	Section A [ ] Section B [ ] Section A: Displays the corresponding indoor address. Section B: Displays [11] for 5 seconds from operation-ON.
	Individual stop	Stops the specified indoor unit. Note) The other indoor units keep the status as they are.	[Setup] Push SW05 for 2 seconds or more set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be stopped. [Release] Return SW01, SW02, SW03 to "1".	Section A [ ] Section B [ ] Section A: Displays the corresponding indoor address. Section B: Displays [00] for 5 seconds from operation-OFF.
	Individual test operation	Operates the specified indoor unit. Note) The other indoor units keep the status as they are.	[Setup] Push SW04 for 10 seconds or more set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be operated. [Release] Return SW01, SW02, SW03 to "1".	Section A [ ] Section B [ ] Section A: Displays the corresponding indoor address. Section B: Displays [FF] for 5 seconds from test operation-ON.

NOTE 1) This start/stop function only sends the signals from the outdoor unit to the indoor unit, such as start, stop, operation mode, etc. It does not resend the signals even if the indoor unit does not follow the sent signals.

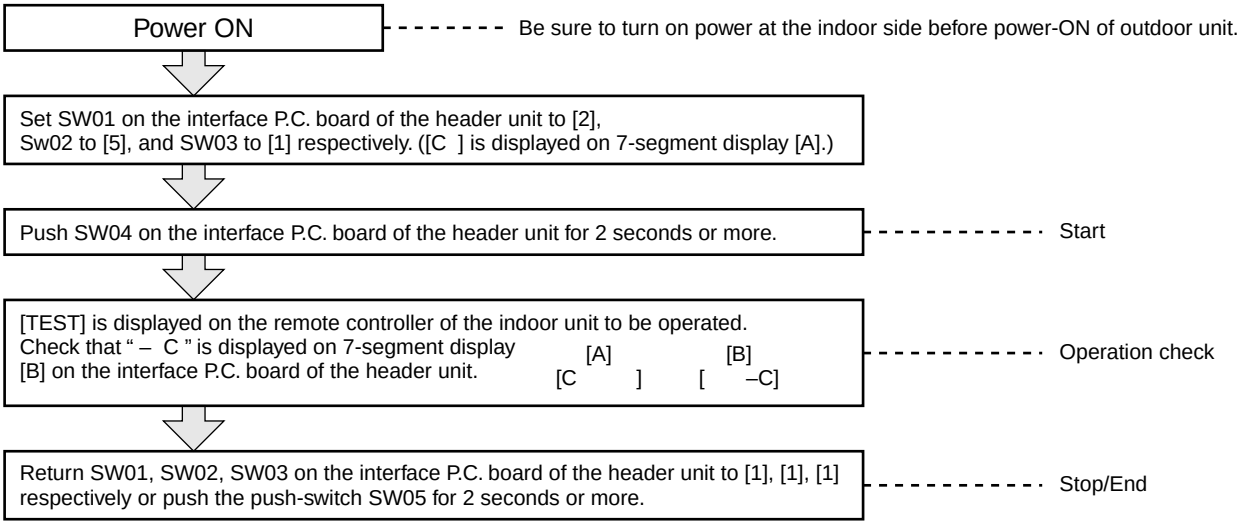
NOTE 2) The above controls are not used during abnormal stop.



1. Cooling test operation function

This function is provided to change collectively the mode of all the indoor units connected to the same system for the cooling test operation mode. Using switches on the interface board of the header unit.

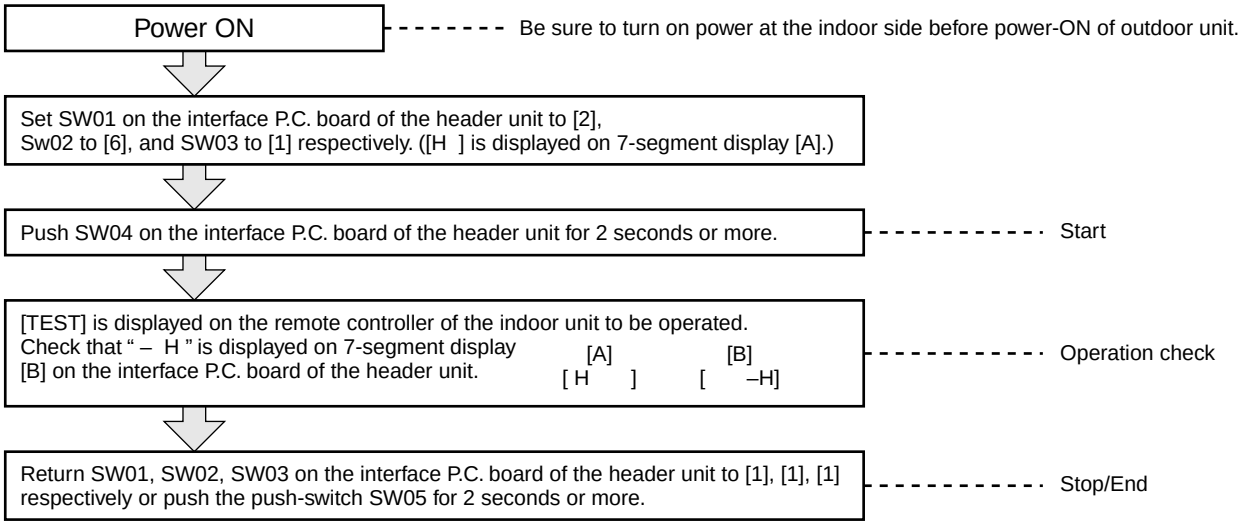
<Operation procedure>

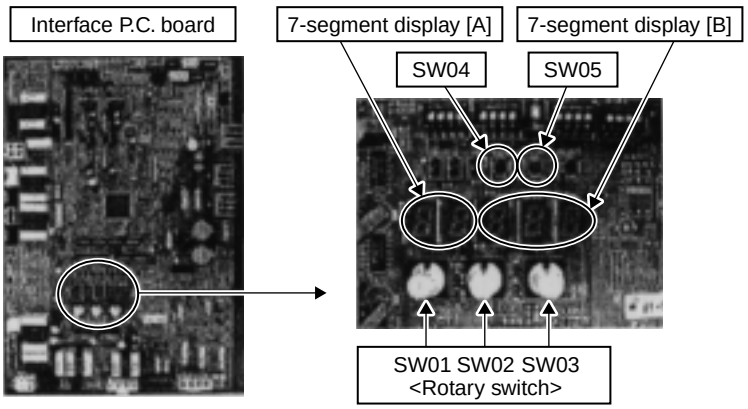


2. Heating test operation function

This function is provided to change collectively the mode of all the indoor units connected to the same system for the heating test operation mode. Using switches on the interface board of the header unit.

<Operation procedure>



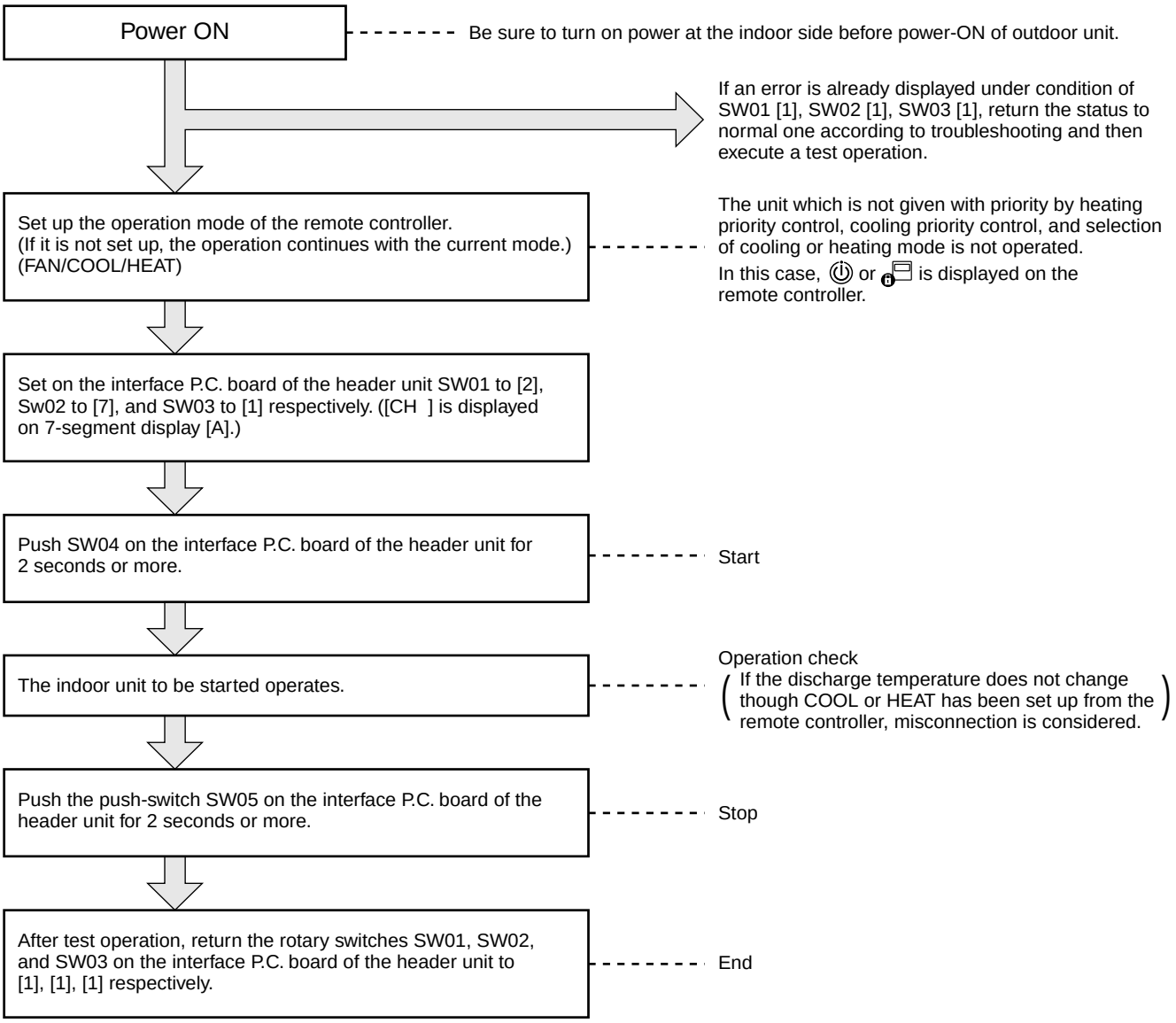


NOTE) The test operation returns to the normal operation after 60 minutes.

3. Batch start/stop (ON/OFF) function

This function is provided to start/stop collectively all the indoor units connected to the same system by using switches on the interface board of the header unit.

<Operation procedure>



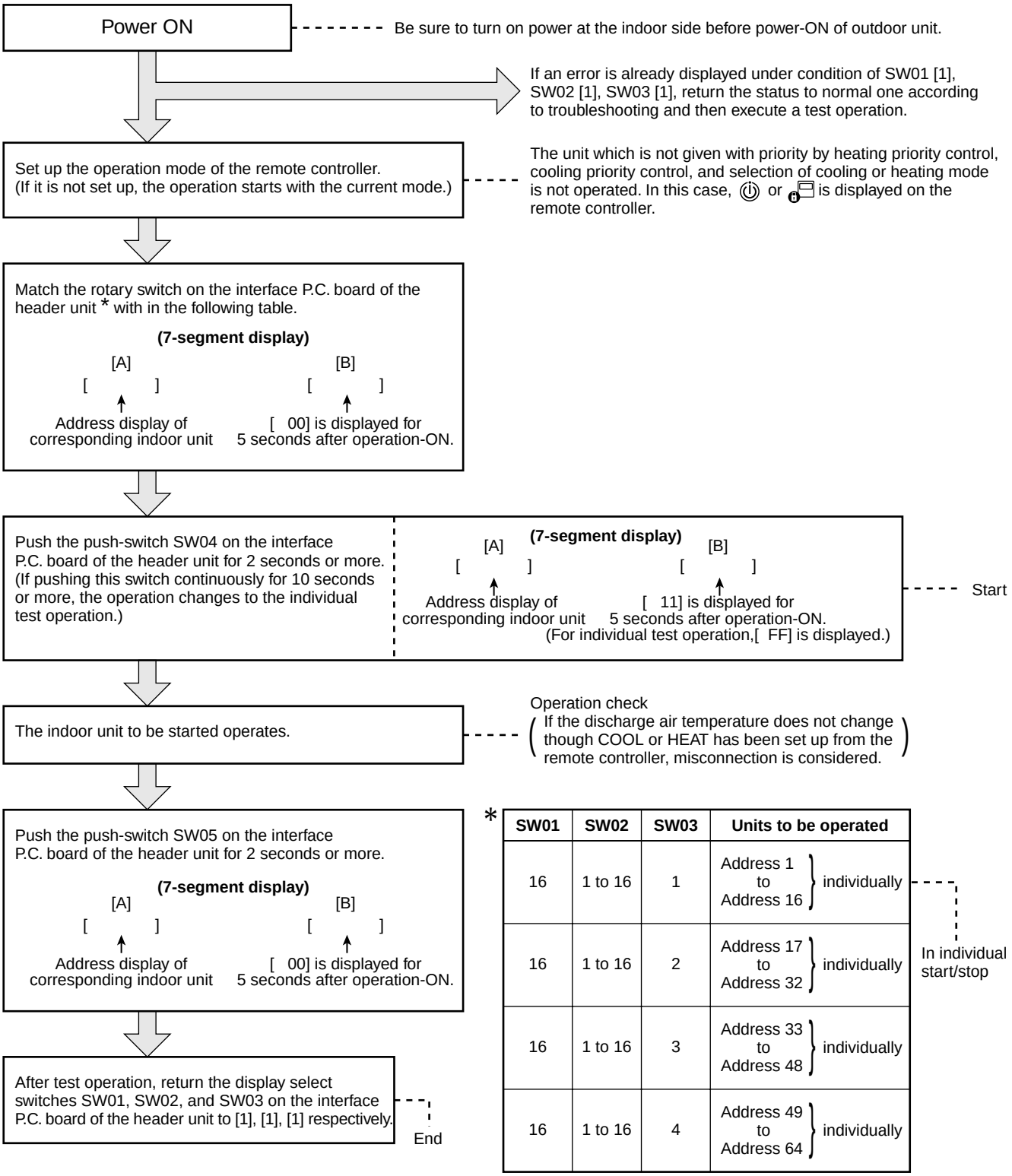
4. Individual start/stop (ON/OFF) individual test operation function

This function is provided to start/stop (ON/OFF) individually each indoor unit connected to the same system by using switches on the interface board of the header unit.

Set SW01 [16] and set SW02, SW03 to indoor address No. (1 to 64) to be started (Refer to the following table*) - only the setup indoor unit starts operation.

(In the rotary switches of the indoor unit which operates in a group by the remote controller, the follower unit cannot be individually started or stopped. In this case, [– –] is displayed on 7-segment display [B] on the interface P.C. board of the header unit.)

<Operation procedure>



*

SW01	SW02	SW03	Units to be operated
16	1 to 16	1	Address 1 to Address 16 } individually
16	1 to 16	2	Address 17 to Address 32 } individually
16	1 to 16	3	Address 33 to Address 48 } individually
16	1 to 16	4	Address 49 to Address 64 } individually

In individual start/stop

NOTE) The individual test operation returns to the normal operation after 60 minutes.

8-7-3. Error Clearing Function

1. Clearing from the main remote controller

[Error clearing in outdoor unit]

Error of the outdoor unit is cleared by the unit of one refrigerant circuit system to which the indoor units operated by the remote controller. (Error of the indoor unit is not cleared.)

For clearing errors, the service monitor function of the remote controller is used.

<Method>

1 **Change the mode to service monitor mode by pushing [CL] + [🔧] buttons simultaneously for 4 seconds or more.**

2 **Using [▲] / [▼] buttons, set "FF" to item code.**

The display in Section A in the following figure is counted with interval of 5 seconds as "0005" → "0004" → "0003" → "0002" → "0001" → "0000".

When the count arrives "0000", the error is cleared.

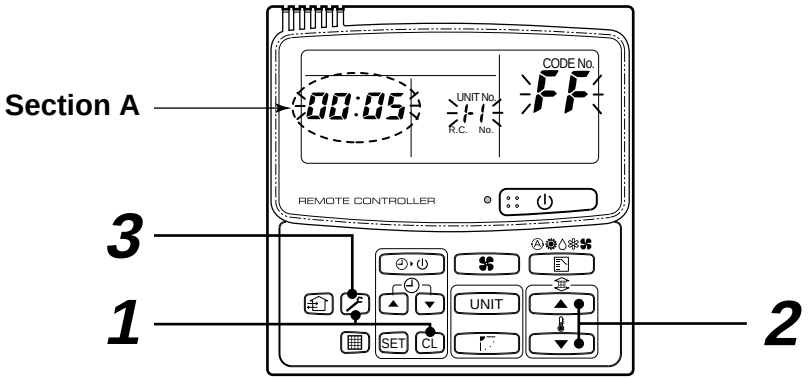
∗ However, counting from "0005" is repeated on the display.

3 **When [🔧] button is pushed, the status returns to the normal status.**

Operation procedure

1 → ***2*** → ***3***

The status returns to the normal status.



[Error clearing in indoor unit]

Error in the indoor unit is cleared by [⏻] button on the remote controller.

(Only error of the indoor unit connected with operating remote controller is cleared.)

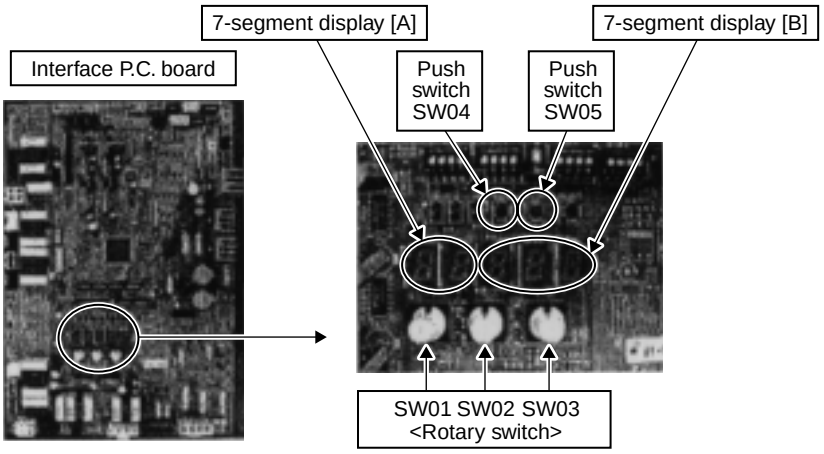
2. Clearing from the interface P.C. board

Using the switches on the interface P.C. board, this function is to clear the currently detected error for each refrigerant circuit system without resetting the power supply.

(→ Restart of error detection)

Errors in both outdoor and indoor units are once cleared.

Set the rotary switches on the interface P.C. board of the header unit to the following setting. SW01=[2] SW02=[16] SW03=[1]	**(7-segment display)** [A] [B] [Er] [ ]
↓	
Push the push-switch SW04 on the interface P.C. board of the header unit for 5 seconds or more.	
↓	
[CL] is displayed in 7-segment display [B] on the P.C. board (for 5 seconds), and the error is completely cleared.	**(7-segment display)** [A] [B] [Er] [CL]



3. Clearing of error check code by power reset

This function is provided to clear error in a refrigerant circuit system by resetting the power of all the outdoor and the indoor units.

(→ Restart of error detection)

As same as the clearing method on the interface P.C. board, errors of both the outdoor and the indoor units are once cleared.

<Method>

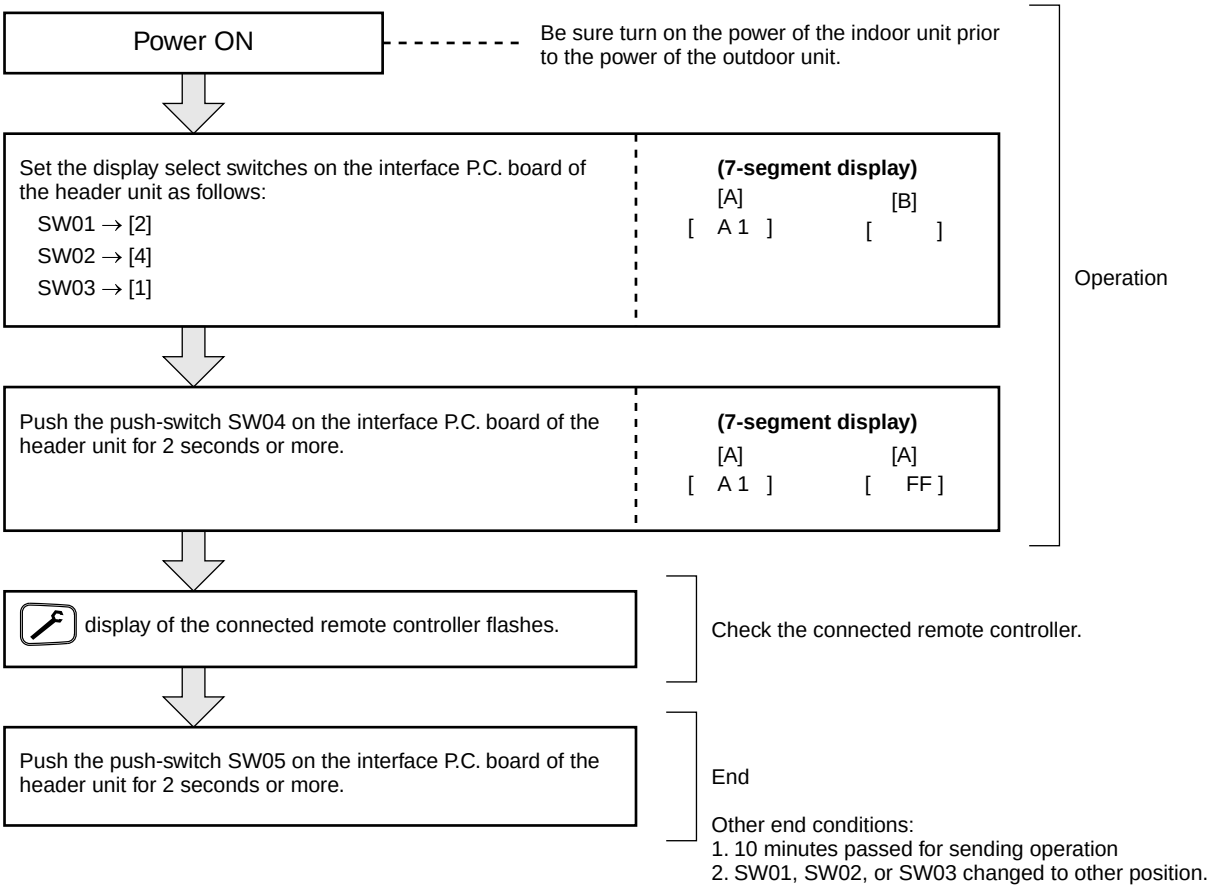
1. Be sure to reset power of both the outdoor and the indoor units.
2. Turn on the power of the indoor unit prior to the power of the outdoor unit.
   (If the power is turned on in reverse order, a check code [E19] (No. of header unit error) is output.)

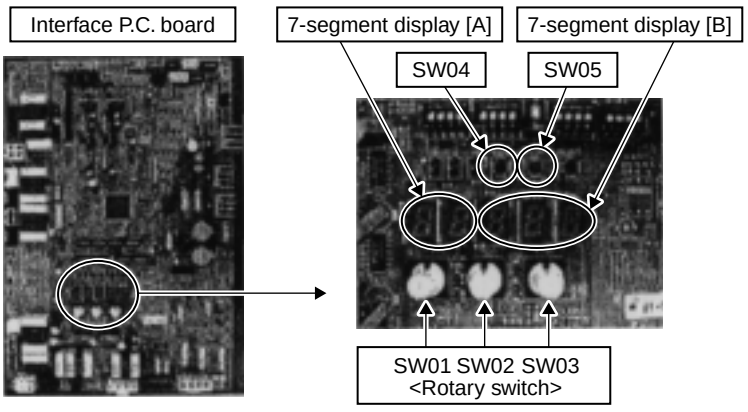
NOTE) After power reset, it requires usually 3 minutes to power-on due to the initial communication of the system. In same cases, it requires Max. 10 minutes.

8-7-4. Remote Controller Distinction Function

This function is provided to distinguish the remote controller connected from the outdoor unit to the indoor unit for a refrigerant circuit system using switches on the interface P.C. board of the header unit.

<Distinction procedure>





8-7-5. Pulse Motor Valve (PMV) Forced Open/Close Function in Indoor Unit

This function is provided to open or close forcedly PMV for 2 minutes in all the indoor units by the switch operation on the interface P.C. board of the header unit.

This function is also used to open PMV fully when turning off the power and executing an operation.

<Operation>

[Open fully]

Set the switch SW01 on the interface P.C. board of the header unit to [2], SW02 to [3], SW03 to [1], and push SW04 for 2 seconds or more.

(Display appears on 7-segment display for 2 minutes as follows.) [P] [FF]

[Close fully]

Set the switch on the interface P.C. board of the header unit SW01 to [2], SW02 to [3], SW03 to [1], and push SW05 for 2 seconds or more.

(Display appears on 7-segment display for one minute as follows.) [P] [00]

[Clear]

After 2 minutes (1 minutes for “Close fully”) passed when setup has finished, the opening automatically returns to the normal opening.

8-7-6. Pulse Motor Valve (PMV) Forced Open Fully/Close fully Function in Outdoor Unit

This function is provided to forcedly open or close fully P.M.V. (PMV1/PMV2) used in the outdoor unit for 2 minutes.

[Open fully]

Short-circuit for CN30 on the outdoor interface P.C. board.

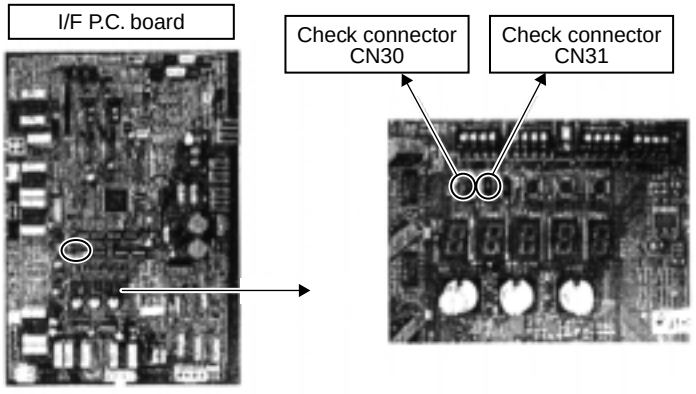
[Close fully]

Short-circuit for CN31 on the outdoor interface P.C. board.

[Clear]

After 2 minutes, the opening returns to the normal opening.

Be sure to remove the short-circuited (as short pin, etc.) after confirmation.



8-7-7. Solenoid Valve Forced Open/Close Function in Outdoor Unit

This function is provided to forcedly open each solenoid valve mounted in the outdoor unit by the switch operation on the interface P.C. board in the outdoor unit to using this function, check there is no refrigerant clogging with ON/OFF operation of the solenoid valve.

[Operation]

1. Set the switch on the interface P.C. board SW01 to [2], SW02 to [1], SW03 to [3].
2. When [H.r] is displayed in 7-segment display [A], keep pushing the switch SW04 for 2 seconds or more.
3. From when [2] is displayed in 7-segment display [B], SV2 is turned on.
4. After then, ON and OFF of each solenoid valve are exchanged by changing the setup number of the switch SW02.

   (ON/OFF output pattern of each solenoid valve is as below.)

   NOTE 1) Display in 7-segment display [B] is exchanged just when the number of SW02 has been changed, on the other hand, the solenoid valve output is exchanged when SW02 has kept with the same number for 5 seconds or more.

   NOTE 2) The mark [○] in the table indicates the corresponding solenoid valve is forcedly turned on.

   NOTE 3) The mark [—] in the table indicates ON/OFF of the solenoid valve is controlled based upon the specifications of the air conditioner.

   NOTE 4) The mark [●] in the table indicates the corresponding solenoid valve is forcedly turned off with this operation.

   NOTE 5) The case heater outputs heat air for both compressor and accumulator heaters.

SW02	7-segment display [B]	Operation pattern of solenoid valve									Case heater output relay
		SV2	SV5	SV41	SV42	SV3A	SV3B	SV3C	SV3D	SV3E	
1	[2]	○	—	—	—	—	—	—	—	○	○
2	[5]	—	○	—	—	—	—	—	—	○	○
3	[4–]	—	—	○	○	—	—	—	—	○	○
4	[3A]	—	—	—	—	○	—	—	—	○	○
5	[3b]	—	—	—	—	—	○	—	—	○	○
6	[3C]	—	—	—	—	—	—	○	—	○	○
7	[3d]	—	—	—	—	—	—	—	○	○	○
8	[3E]	—	—	—	—	—	—	—	—	●	○
9	[3–]	—	—	—	—	○	○	○	—	—	○
10 to 15	[ ]	—	—	—	—	—	—	—	—	○	○
16	[ALL]	○	○	○	○	○	○	○	○	○	○

[Clear]

Return numbers of SW01, SW02, and SW03 on the interface P.C. board to [1/1/1] each.

NOTE) As this function is not based on the specified general control, be sure to release this mode after operation.

8-7-8. Fan Operation Check in Outdoor Unit

This function is provided to check the fan operation on the interface P.C. board in the outdoor unit. The frequency of the fan speed can be controlled.

Therefore utilize this function to check the operation or abnormal sound in the fan system.

NOTE) Do not use this function during operation of the compressor. It may damage the compressor.

[Operation]

1. Set the switch on the interface P.C. board of the outdoor unit SW01 to [2], SW02 to [1], SW03 to [4].
2. When [F. d] is displayed in 7-segment display [A], keep pushing the switch SW04 for 2 seconds or more.
3. From when fan step [31] is displayed in 7-segment display [B], the fan starts operation. (Max. step operation)
4. After then, 7-segment display [B] and the fan step are changed by changing the setup number of the switches SW02 and SW03.

   (Output pattern of the fan is as follows.)

SW01	SW02	SW03	7-segment display [B]	Fan step
2	1	4	[31]	31
	2		[30]	30
	3		[29]	29
	4		[28]	28
	5		[27]	27
	6		[26]	26
	7		[25]	25
	8		[24]	24
	9		[23]	23
	10		[22]	22
	11		[21]	21
	12		[20]	20
	13		[19]	19
	14		[18]	18
	15		[17]	17
	16		[16]	16

SW01	SW02	SW03	7-segment display [B]	Fan step
2	1	5	[15]	15
	2		[14]	14
	3		[13]	13
	4		[12]	12
	5		[11]	11
	6		[10]	10
	7		[9]	9
	8		[8]	8
	9		[7]	7
	10		[6]	6
	11		[5]	5
	12		[4]	4
	13		[3]	3
	14		[2]	2
	15		[1]	1
	16		[0]	0

[Clear]

This function is cleared by one of the following operations.

1. When SW01 setting number was changed to other number.
2. Push-switch SW05 was pushed for 2 seconds or more.

8-7-9. Abnormal Outdoor Unit Discrimination Method <By Fan Operating Function>

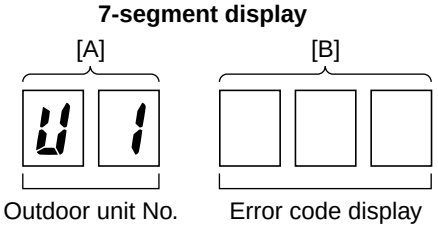
This function is provided to forcedly operate the fan of the outdoor unit in which an error occurred or the fan of the normal outdoor unit by the switch operation on the interface P.C. board in the header unit.

To specify which one of the follower units connected to the system was faulty, use this function for the system stop due to a follower unit fault (Check code [E28]).

[Operation]

<In case to operate the fan in the erroneous outdoor unit only>

1. Check all the switches, SW01, SW02, and SW03 on the interface P.C. board in the header unit are set to [1].



2. Push the push-switch SW04 for 2 seconds or more.
3. “E 1” is displayed on 7-segment display [A].
4. The fan of the outdoor unit in which error occurred starts operation within approx. 10 seconds when “E 1” was displayed.

<In case to operate the fans in all the normal outdoor units>

1. Check all the switches, SW01, SW02, and SW03 on the interface P.C. board are set to [1/1/1].
2. Push the push-switches SW04 and SW05 at the same time for 2 seconds or more.
3. “E 0” is displayed on 7-segment display [A].
4. The fans of all the normal outdoor units start operation with the Max. fan speed within approx. 10 seconds when “E 0” was displayed.

[Release]

Push the push-switch SW05 on the interface P.C. board in the header unit for 2 seconds or more.

The outdoor fan which was operated stops.

* Check [U. 1] is displayed on 7-segment display [A], and then finish the work.

8-7-10. Manual Adjustment Function of Outside Temp (TO) Sensor

This function is provided to fix TO sensor value manually by the switch operation on the interface P.C. board in the outdoor unit. When the unit stops abnormally due to TO sensor failure, etc, an emergent operation is available by set up the value manually to position near the current outside temperature.

[Operation]

1. Set the rotary switches on the interface P.C. board to numbers as follows.
   - SW01 [2] / SW02 [1] / SW03 [15]
   - 7-segment display: [t o]

SW01	SW02	7-segment display [B]	TO sensor value
1	1	[10]	10°C
	2	[15]	15°C
	3	[20]	20°C
	4	[25]	25°C
	5	[30]	30°C
	6	[35]	35°C
	7	[40]	40°C
	8	[43]	43°C

SW01	SW02	7-segment display [B]	TO sensor value
1	9	[45]	45°C
	10	[–15]	–15°C
	11	[–10]	–10°C
	12	[– 5]	–5°C
	13	[0]	0°C
	14	[2]	2°C
	15	[5]	5°C
	16	[7]	7°C

NOTE) Emergent operation should be restricted to one day or so on. If operating TO sensor fixed with this function, the system control operation of the air conditioner may not become one based upon the specification of the product. Therefore an emergent operation should be restricted to a day or so on.

2. Keep pushing the push-switch SW04 on the interface P.C. board for 1 second or more.
   The mode changes to the TO sensor value fix manual mode.
3. As shown in the following table, TO sensor value can be fixed by setting the rotary switch SW02 on the interface P.C. board.

[Clear]

Return numbers of SW01, SW02, and SW03 on the interface P.C. board in the outdoor unit to [1/1/1] each.

<Service support function list>

SW01	SW02	SW03	7-segment display [A]	Function contents
2	1	1	[J C]	Refrigerant circuit and control communication line check function (Cooling operation)
	2		[J H]	Refrigerant circuit and control communication line check function (Heating operation)
	3		[P]	Indoor PMV forced full open function
	4		[A 1]	Indoor remote controller discriminating function
	5		[C]	Cooling test operation function
	6		[H]	Heating test operation function
	7		[C H]	Indoor collective start/stop (ON/OFF) function
	11		[r d]	Outdoor refrigerant recovery operation function (Pump down function)
	16		[E r]	Error clear function

2	1 to 16	3	[H r]	Solenoid valve forced open/close function
2		4 to 5	[F d]	Fan forced operation function
2		15	[t o]	Outside temp sensor manual adjustment function

16	1 to 16	1	[0 1] to [1 6]	Indoor No. 1 to 16 unit	Indoor individual start/stop (ON/OFF) function
		2	[1 7] to [3 2]	Indoor No.17 to 32 unit	
		3	[3 3] to [4 8]	Indoor No.33 to 48 unit	
		4	[4 9] to [6 4]	Indoor No.49 to 64 unit	

SW01	SW-2	SW03	7-segment display [A/B]	Function contents
1	1	1	[U 1] [E28]	Follower unit error / Corresponding unit fan operation function

8-7-11. Indoor Fan Operation Check Function

This function is provided to check operation of single indoor unit without using communication with the remote controller or outdoor unit. This function can be used regardless operating or stopping of the system.

However, if this function is used for a long time, a trouble of the air conditioner may be caused. Therefore using of this function should be restricted to several minutes.

[Operation]

1. Short-circuit CHK pin (CN71 on the indoor P.C. board).

   If short-circuiting DISP pin (CN72 on the indoor P.C. board) while short-circuiting CHK pin (CN71 on the indoor P.C. board), the indoor PMV only becomes the minimum opening (30 pulse). When opening DISP pin, it becomes the maximum opening again.

[Clear]

Open CHK pin. If the system is operating, it stops once but automatically restart after several minutes.

* For the details of CHK pin (CN71 on indoor P.C. board) and DISP pin (CN72 on indoor P.C. board), refer to **11. Control circuit configuration, Indoor unit 2, Indoor P.C. board MCC-1402 and MCC-1403**.

8-7-12. Indoor Fan Only Operating Mode

When operating an air conditioner with indoor units and remote controller only in fan operation etc., this function can be used. A group operation is also available.

[Operation]

1) Short circuit DISP pin (CN72 on the indoor P.C. board). However, if CHK pin (CN71 on the indoor P.C. board) has been previously short circuited, this function is unavailable.

2) In a group operation, set up a group as usual.

3) While DISP pin is short circuited, all the sensor error judgment operation and communication with the outdoor unit are not performed. PMV is fixed to the Max. opening.

[Clear]

Open DISP pin.

8-7-13. Monitor Function of Remote Controller Switch

When using a remote controller with the model name RBC-ATM21E, the following monitor functions can be used.

<Calling of display screen>

[Contents]

The temperature or the operation status of the remote controller, indoor unit, or each sensor of the outdoor unit can be known by calling up the service monitor mode from the remote controller.

[Procedure]

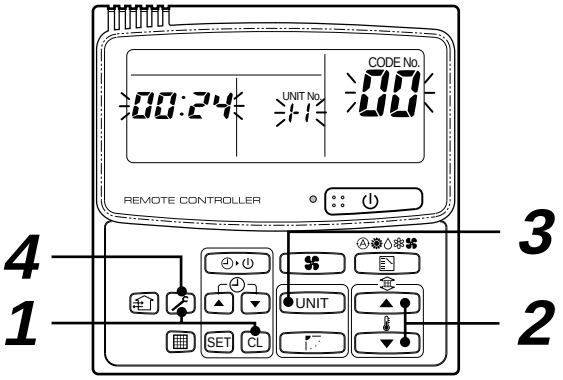
1 **Push [CL] + [🔧] buttons simultaneously for 4 seconds or more to call up the service monitor mode. The service monitor goes on, and temperature of the item code *00* is firstly displayed.**

2 **Push the temperature setup [▲] / [▼] buttons to select the item number (Item code) to be monitored.**

For displayed codes, refer to the table below.

3 **Push [UNIT] button to change the item to one to be monitored. Then monitor the indoor unit and sensor temperature or operation status in the corresponding refrigerant line.**

4 **Pushing [🔧] button returns the display to the normal display.**



Operation procedure

1 → ***2*** → ***3*** → ***4***

Returns to the normal display

	Item code	Data name	Unit	Display format
Indoor unit data (NOTE 2)	00	Room temp (During control)	°C	
	01	Room temp (Remote controller)	°C	
	02	Indoor suction temp (TA)	°C	× 1
	03	Indoor coil temp (TCJ)	°C	× 1
	04	Indoor coil temp (TC2)	°C	× 1
	05	Indoor coil temp (TC1)	°C	× 1
	06	Indoor discharge temp (Tf) (NOTE 1)	°C	× 1
	08	Indoor PMV opening	pulse	× 1/10
System data	0A	No. of connected indoor units	unit	
	0b	Total HP of connected indoor units	HP	× 10
	0C	No. of connected outdoor units	unit	
	0d	Total HP of indoor units	HP	× 10

	Item code	Data name	Unit	Display format
Outdoor unit individual data (NOTE 4, 5)	10	Compressor 1 discharge temp (Td1)	°C	× 1
	11	Compressor 2 discharge temp (Td2)	°C	× 1
	12	High-pressure sensor detention pressure (Pd)	MPa	× 100
	13	Low-pressure sensor detention pressure (Ps)	MPa	× 100
	14	Suction temp (TS)	°C	× 1
	15	Outdoor heat exchanger temp (TE)	°C	× 1
	16	Temp at liquid side (TL)	°C	× 1
	17	Outside ambient temp (TO)	°C	× 1
	18	Low-pressure saturation temp (TU)	°C	× 1
	19	Compressor 1 current (I1)	A	× 10
	1A	Compressor 2 current (I2)	A	× 10
	1b	PMV1 + 2 opening	pulse	× 1/10
	1d	Compressor 1, 2 ON/OFF	—	(NOTE 3)
	1E	Outdoor fan mode	—	0 to 31
	1F	Outdoor unit HP	HP	× 1

(NOTE 1) Only a part of indoor unit types is installed with the discharge temperature sensor. This temperature is not displayed for other types.

(NOTE 2) When the units are connected to a group, data of the header indoor unit only can be displayed.

(NOTE 3) 01 : Compressor 1 only is ON.
10 : Compressor 2 only is ON.
11 : Both compressor 1 and 2 are ON.

(NOTE 4) For item code, an example of the header unit is described.

(NOTE 5) The upper digit of the item code indicates the outdoor unit No.
1 : Header unit (A)
2 : Follower unit (B)
3 : Follower unit (C)
4 : Follower unit (D)

9. TROUBLESHOOTING

9-1. Troubleshooting Summary

1. Before troubleshooting

1) Applied models

All Super Module Multi-system type models

(Indoor unit: MMX-APXXX, Outdoor unit: MMY-MAPXXX)

2) Required tools / measuring devices

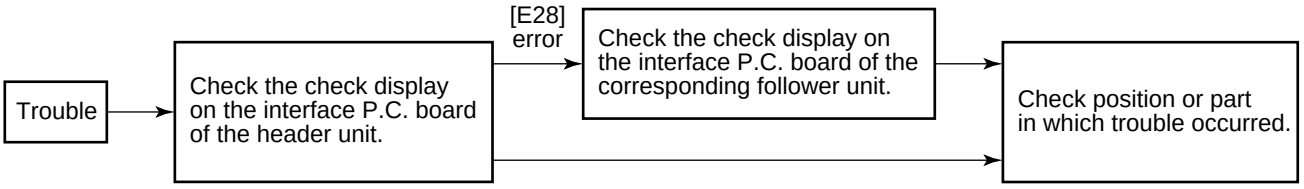
- Screwdrivers (Philips, Minus), spanner, radio pinchers, nipper, push pin for reset switch, etc.
- Tester, thermometer, pressure gauge, etc.

3) Confirmation before check (The following items are not troubles.)

No.	Operation	Check items
1	Compressor does not operate.	• Is not delayed for 3 minutes? (3 minutes after compressor-OFF) • Is not thermostat OFF? • Is not the fan operating or timer? • Is not the system initially communicating?
2	Indoor fan does not work.	• Is not the cold draft prevention being controlled in heating operation?
3	Outdoor fan does not rotate, or fan speed changes.	• Is not low cooling operation being controlled? • Is not a defrost operation being performed?
4	Indoor fan does not stop.	• Is not after-heat elimination operation being controlled after heating operation?
5	Start/stop operation on remote controller is unavailable.	• Is not auxiliary unit or remote control being operated?
6	——	• Is connecting wire of indoor unit or remote controller correct?

2. Troubleshooting procedure

When a trouble occurred, advance the check operation in the following procedure.



NOTE) While a check operation is performed, a malfunction of the microprocessor may be caused due to condition of the power supply or the external noise. If there is any noise source, change wires of the remote controller and signal wires to shield wires.

9-2. Check Method

On the remote controller (Main remote controller, Central control remote controller) and the interface P.C. board of the outdoor unit, a check display LCD (Remote controller) or 7-segment display (on the outdoor interface P.C. board) to display the operation is provided. Therefore the operation status can be known. Using this self-diagnosis function, a trouble or position with trouble of the air conditioner can be found as shown in the table below.

Check code list

The following list shows each check code. Find the check contents from the list according to part to be checked.

- In case of check from indoor remote controller: See “Main remote controller display” in the list.
- In case of check from outdoor unit: See “Outdoor 7-segment display” in the list.
- In case of check from AI-NET central control remote controller: See “AI-NET central control display” in the list.
- In case of check from indoor unit with wireless remote controller: See “Sensor block display of receiving unit” in the list.

IPDU: Intelligent Power Drive Unit
○ : Lighting, ¤ : Flashing, ● : Goes off
ALT.: Flashing is alternately when there are two flashing LED.
SIM: Simultaneous flashing when there are two flashing LED

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Sub code		Operation ⏻	Timer 🕘	Ready ☼	Flash		
E01	—	—	—	¤	●	●		Communication error between indoor and remote controller (Detected at remote controller side)	Remote controller
E02	—	—	—	¤	●	●		Sending error of remote controller	Remote controller
E03	—	—	97	¤	●	●		Communication error between indoor and remote controller (Detected at indoor side)	Indoor
E04	—	—	04	●	●	¤		Communication circuit error between indoor and outdoor (Detected at indoor side)	Indoor
E06	E06	No. of indoor units in which sensor has been normally received	04	●	●	¤		Decrease of No. of indoor units	I/F
—	E07	—	—	●	●	¤		Communication circuit error of indoor and outdoor (Detected at outdoor side)	I/F
E08	E08	Duplicated indoor addresses	96	¤	●	●		Duplicated indoor addresses	Indoor / I/F
E09	—	—	99	¤	●	●		Duplicated master remote controllers	Remote controller
E10	—	—	CF	¤	●	●		Communication error in indoor P.C. B ass'y	Indoor
E12	E12	01: Indoor/Outdoor communication 02: Communication between outdoor units	42	¤	●	●		Automatic address start error	I/F
E15	E15	—	42	●	●	¤		No indoor automatic address	I/F
E16	E16	00: Capacity over 01: No. of connected units	89	●	●	¤		No. of connected indoor units / Capacity over	I/F
E18	—	—	97, 99	¤	●	●		Communication error between indoor header and follower units	Indoor
E19	E19	00: No header unit 02: Two or more header units	96	●	●	¤		Outdoor header units quantity error	I/F
E20	E20	01: Outdoor of other line connected 02: Indoor of other line connected	42	●	●	¤		Other line connected during automatic address	I/F
E23	E23	—	15	●	●	¤		Sending error in communication between outdoor units	I/F
E25	E25	—	15	●	●	¤		Duplicated follower outdoor addresses	I/F
E26	E26	No. of outdoor units which received signal normally	15	●	●	¤		Decrease of No. of connected outdoor units	I/F
E28	E28	Detected outdoor unit number	d2	●	●	¤		Follower outdoor error	I/F
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 error 04: Fan IPDU error 05: IPDU + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	●	●	¤		IPDU communication error	I/F

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Sub code		Operation	Timer	Ready	Flash		
F01	—	—	OF	¤	¤	●	ALT	Indoor TCJ sensor error	Indoor
F02	—	—	Od	¤	¤	●	ALT	Indoor TC2 sensor error	Indoor
F03	—	—	93	¤	¤	●	ALT	Indoor TC1 sensor error	Indoor
F04	F04	—	19	¤	¤	○	ALT	TD1 sensor error	I/F
F05	F05	—	A1	¤	¤	○	ALT	TD2 sensor error	I/F
F06	F06	—	18	¤	¤	○	ALT	TE1 sensor error	I/F
F07	F07	—	18	¤	¤	○	ALT	TL sensor error	I/F
F08	F08	—	1b	¤	¤	○	ALT	TO sensor error	I/F
F10	—	—	OC	¤	¤	●	ALT	Indoor TA sensor error	Indoor
F12	F12	—	A2	¤	¤	○	ALT	TS1 sensor error	I/F
F13	F13	01: Comp. 1 side 02: Comp. 2 side	43	¤	¤	○	ALT	TH sensor error	IPDU
F15	F15	—	18	¤	¤	○	ALT	Outdoor temp sensor misconnecting (TE, TL)	I/F
F16	F16	—	43	¤	¤	○	ALT	Outdoor pressure sensor misconnecting (Pd, Ps)	I/F
F23	F23	—	43	¤	¤	○	ALT	Ps sensor error	I/F
F24	F24	—	43	¤	¤	○	ALT	Pd sensor error	I/F
F29	—	—	12	¤	¤	●	SIM	Indoor other error	Indoor
F31	F31	—	1C	¤	¤	○	SIM	Outdoor EEPROM error	I/F
H01	H01	01: Comp. 1 side 02: Comp. 2 side	IF	●	¤	●		Compressor break down	IPDU
H02	H02	01: Comp. 1 side 02: Comp. 2 side	1d	●	¤	●		Magnet switch error Overcurrent relay operation Compressor error (lock)	MG-SW Overcurrent relay IPDU
H03	H03	01: Comp. 1 side 02: Comp. 2 side	17	●	¤	●		Current detect circuit system error	IPDU
H04	H04	—	44	●	¤	●		Comp 1 case thermo operation	I/F
H06	H06	—	20	●	¤	●		Low pressure protective operation	I/F
H07	H07	—	d7	●	¤	●		Oil level down detective protection	I/F
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	●	¤	●		Oil level detective temp sensor error	I/F
H14	H14	—	44	●	¤	●		Comp 2 case thermo operation	I/F
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	●	¤	●		Oil level detective circuit error Magnet switch error Overcurrent relay operation	I/F MG-SW Overcurrent relay
L03	L03	—	96	¤	●	¤	SIM	Duplicated indoor header units	Indoor
L04	L04	—	96	¤	○	¤	SIM	Duplicated outdoor line addresses	I/F
L05	L05	—	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed on indoor unit with priority)	I/F
L06	L06	No. of indoor units with priority	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in unit other than indoor unit with priority)	I/F
L07	—	—	99	¤	●	¤	SIM	Group line in individual indoor unit	Indoor
L08	L08	—	99	¤	●	¤	SIM	Indoor group/Address unset	Indoor I/F
L09	—	—	46	¤	●	¤	SIM	Indoor capacity unset	Indoor
L10	L10	—	88	¤	○	¤	SIM	Outdoor capacity unset	I/F
L20	—	—	98	¤	○	¤	SIM	Duplicated central control addresses	AI-NET Indoor
L28	L28	—	46	¤	○	¤	SIM	Over No. of connected outdoor units	I/F
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU3 error 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	¤	○	¤	SIM	No. of IPDU error	I/F
L30	L30	Detected indoor address	b6	¤	○	¤	SIM	Auxiliary interlock in indoor unit	Indoor
—	L31	—	—	—				IC error	I/F

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
P01	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P03	P03	—	1E	¤	●	¤	ALT	Discharge temp TD1 error	I/F
P04	P04	01: Comp. 1 side 02: Comp. 2 side	21	¤	●	¤	ALT	High-pressure SW detection error	IPDU
P05	P05	01: Phase-missing detection 02: Phase order error	AF	¤	●	¤	ALT	Phase-missing detection / Phase order error	I/F
P07	P07	01: Comp. 1 side 02: Comp. 2 side	1C	¤	●	¤	ALT	Heat sink overheat error	IPDU I/F
P10	P10	Detected indoor address	Ob	●	¤	¤	ALT	Indoor overflow error	Indoor
P12	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P13	P13	—	47	●	¤	¤	ALT	Outdoor liquid back detection error	I/F
P15	P15	01: TS condition 02: TD condition	AE	¤	●	¤	ALT	Gas leak detection	I/F
P17	P17	—	bb	¤	●	¤	ALT	Discharge temp TD2 error	I/F
P19	P19	Detected outdoor unit number	08	¤	●	¤	ALT	4-way valve inverse error	I/F
P20	P20	—	22	¤	●	¤	ALT	High-pressure protective operation	I/F
P22	P22	0 ⎵ : IGBT short 1 ⎵ : Fan motor position detective circuit error 3 ⎵ : Fan motor trouble C ⎵ : TH sensor temp. error (Heat sink overheat) D ⎵ : TH sensor error E ⎵ : Vdc output error	1A	¤	●	¤	ALT	Outdoor fan IPDU error	Fan IPDU
P26	P26	01: Comp. 1 side 02: Comp. 2 side	14	¤	●	¤	ALT	G-TR short protection error	IPDU
P29	P29	01: Comp. 1 side 02: Comp. 2 side	16	¤	●	¤	ALT	Comp position detective circuit system error	IPDU
P31	—	—	47	¤	●	¤	ALT	Other indoor unit error (Group follower unit error)	Indoor
—	—	—	b7	By alarm device			ALT	Error in indoor group	AI-NET
—	—	—	97	—				AI-NET communication system error	AI-NET
—	—	—	99	—				Duplicated network adaptors	AI-NET

Error detected by TCC-LINK central control device

Check code				Wireless remote controller				Check code name	Judging device
Central control device indication	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
C05	—	—	—	—				Sending error in TCC-LINK central control device	TCC-LINK
C06	—	—	—	—				Receiving error in TCC-LINK central control device	TCC-LINK
C12	—	—	—	—				Batch alarm of general-purpose equipment control interface	HA control interface I/F
O30	Differs according to error contents of unit with occurrence of alarm							Group control follower unit error	TCC-LINK
	—	—	(L20 is displayed.)					Duplicated central control addresses	

New check code

1. Difference between the TCC LINK and AI-NET check code

The displaying method of the check code changes in this model and after.

	AI-NET check code	TCC Link
Used characters	Hexadecimal notation, 2 digits	Alphabet + Decimal notation, 2 digits
Characteristics of code classification	Few classification of communication/ incorrect setup system	Many classification of communication/incorrect setup system
Block display	Indoor P.C. board, Outdoor P.C. board, Cycle, Communication	Communication/Incorrect setup (4 ways), Indoor protection, Outdoor protection, Sensor, Compressor protection, etc.

< Display in wired remote controller >

- [⚠] goes on.
- [UNIT No.] + Check code + Operation lamp (Green) flash

<Display on sensor part in wireless remote controller>

- Block display of combination of [⏻] [🕘] [❁]

<Display on 7-segment in outdoor unit>

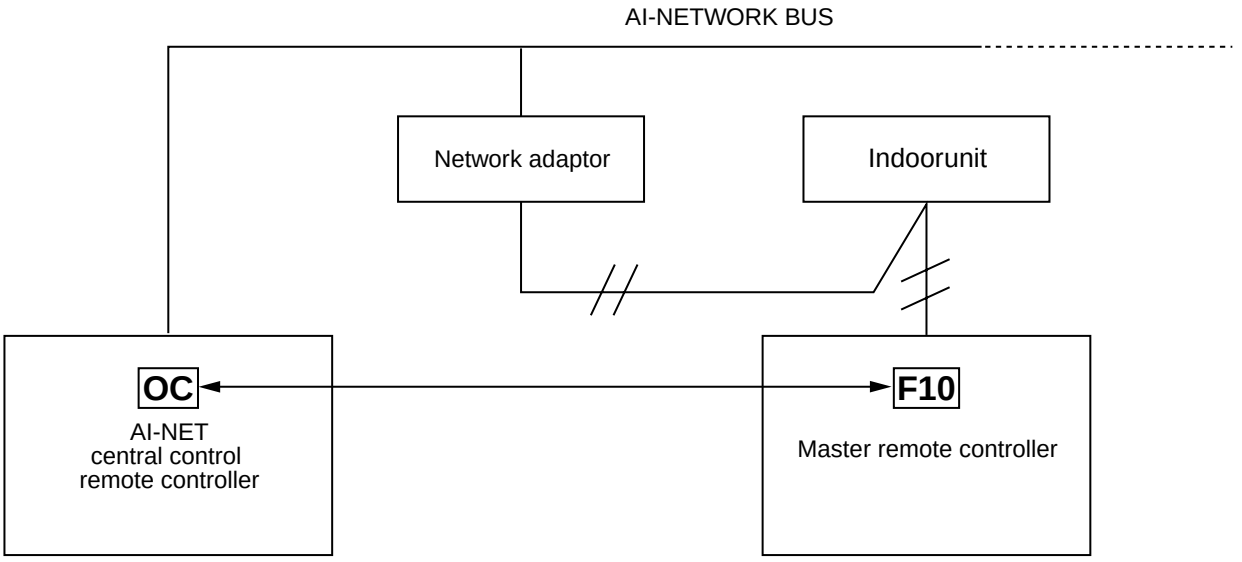
- Unit No. and check code are displayed.
- In a case of error with auxiliary code, the check code and the auxiliary code are displayed alternately.

Display	Classification
A	Unused
C	Central control system error
E	Communication system error
F	Each sensor error (Failure)
H	Compressor protective system error
J	Unused
L	Setup error, Other errors
P	Protective device operation

2. Special mention

1) If this model is connected to AI-NET by network adaptor, the different check codes are displayed on the main remote controller (New check code display on new remote controller) and AI-NET central control remote controller (AI-NET check code display on AI-NET central control remote controller).

   Example) Indoor TA sensor error



2) The check code of the remote controller is displayed only while the air conditioner is operating (Remote controller start button ON). When the air conditioner stopped and the error has been cleared, the check code display on the remote controller also disappears. However, if the error continues after stop of the operation, the check code is immediately displayed with restarting of the operation.

9-3. Troubleshooting by Check Display on Remote Controller

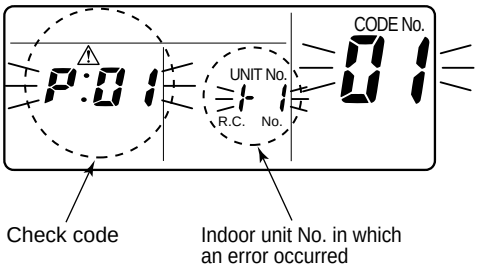
In case of main remote controller (RBC-AMT21E)

1. Confirmation and check

When a trouble occurred on the air conditioner, the check code and the indoor unit No. are displayed on the display section of the remote controller.

The check code is displayed while the air conditioner operates.

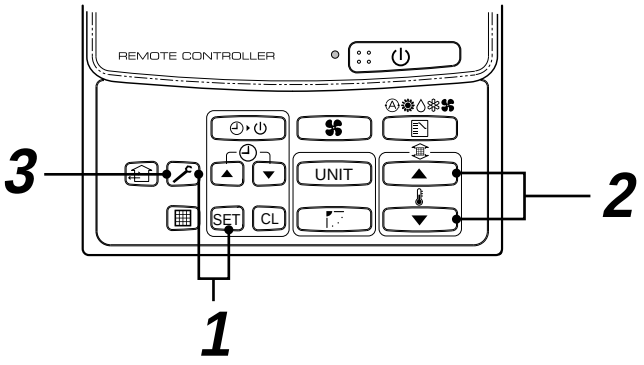
If the display disappeared, operate the air conditioner and check the error based upon the following “Confirmation of error history”.

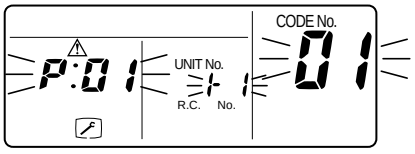


2. Confirmation of error history

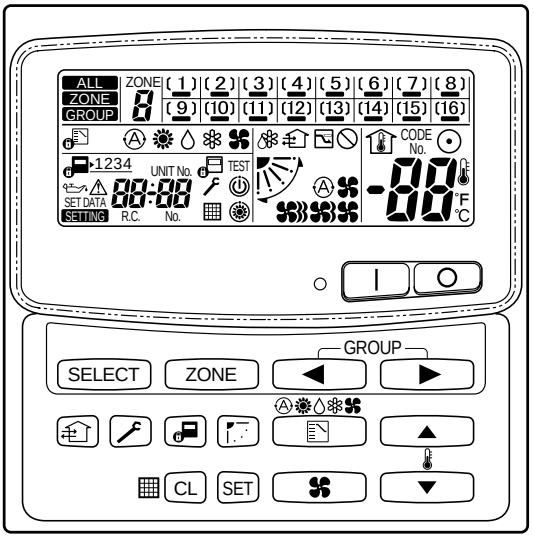
When a trouble occurred on the air conditioner, the error history can be confirmed with the following procedure.
(Up to 4 error histories are stored in memory.)

This history can be confirmed from either operating status or stop status.



Procedure	Description
1	When pushing [SET] and [🔧] buttons simultaneously for 4 seconds or more, the below display appears. If [Service Check] is displayed, the mode enters in the error history mode. • [01: Error history order] is displayed in code number window. • [Check Code] is displayed in check code window. • [Indoor unit address with error] is displayed in UNIT No. 
2	Every pushing temp. set [▲] / [▼] buttons, the error histories stored in the memory are displayed in order. The numbers in item code indicates item code [01] (Latest) to [04] (Oldest). **CAUTION** Do not push [CL] button because all the error histories of the indoor unit will be deleted.
3	After confirmation, push [🔧] button to return to the usual display.

In case of TCC-LINK central control remote controller (TCB-SC642TLE)

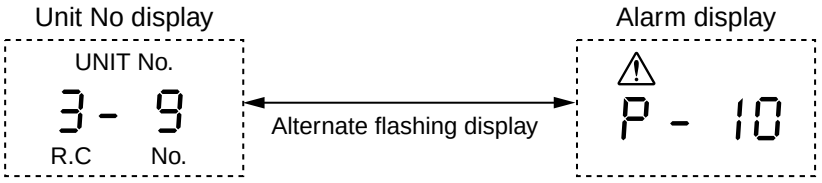


1. Confirmation and check

When a trouble occurred on the air conditioner, the check code and the indoor unit No. are displayed on the display section of the remote controller.

The check code is displayed while the air conditioner operates.

If the display disappeared, operate the air conditioner and check the error based upon the following “Confirmation of error history”.

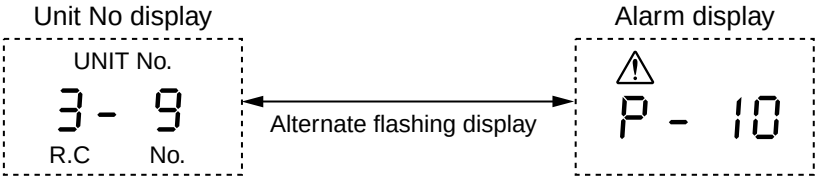


2. Confirmation of error history

When a trouble occurred on the air conditioner, the error history can be confirmed with the following procedure. (Up to 4 error histories are stored in memory.)

This history can be confirmed from either operating or stop.

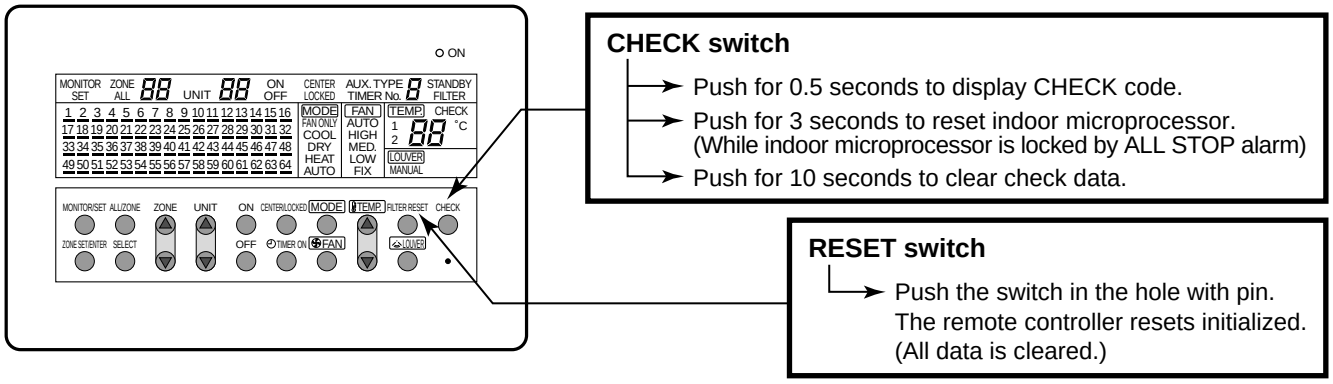
1) Push [🔧] and [SET] buttons in succession for 4 seconds or more.
2) SERVICE CHECK [🔧] goes on and Item code 01 goes on.
3) When selecting (flash) the group number if there is the alarm history, the UNIT number and the latest alarm history are displayed alternately.
   * In this time, the temperature cannot be set up.
4) To confirm the alarm history other than the latest one, push temp. set [▲] / [▼] to select Item code (01 to 04).
5) To confirm the alarm in the other group, push [ZONE] and [GROUP ◀ ▶] to select the group number
   Do not push [CL] button because all the alarm histories of the currently selected group are deleted.
6) To finish the service check, push [🔧] button.



In case of AI-NET central control remote controller

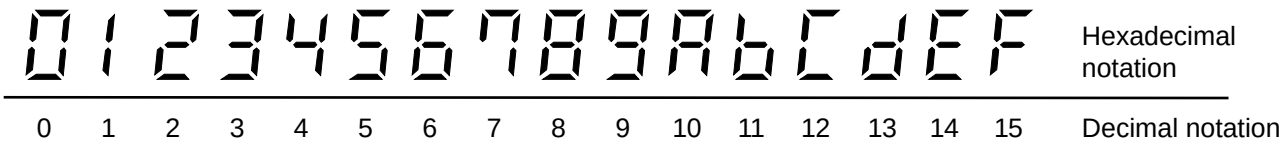
1. Operation for CHECK display

When pushing the CHECK switch, the indoor unit No. (Network address No.) including the check data is displayed in the UNIT No. display section, and the check code is displayed in the set up temp. display section.

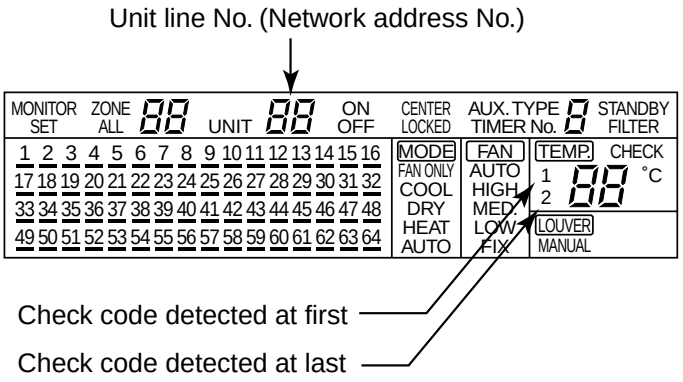


2. Reading of CHECK monitor display

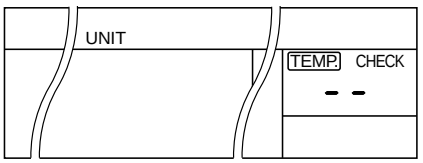
<7 segment display>



<Display on CHECK monitor>

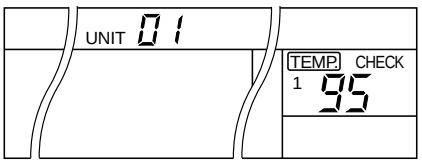


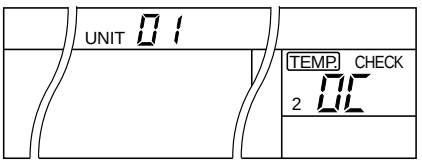
(Example)
There is no check data.

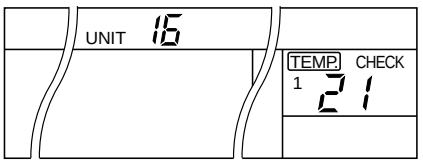


<CHECK data>

(Example)
In No.1 unit, first the interconnection wire (bus communication line) of indoor/outdoor has failed.
Next, the room temp. sensor is defective.
For No.16 unit, the high pressure switch at the inverter unit side operates.







9-4. Check Code and Check Position Displayed on the Remote Controller and Outdoor Unit (7-Segment Display of Interface)

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
E01	—	—	—	Remote controller	Communication error between indoor and remote controller (Detected at remote controller side)	Corresponding unit only stops.	Communication interrupted between indoor P.C. board and remote controller.	• Check remote controller inter-unit cable (A/B). • Check disconnection, connector contact error. • Check indoor power supply. • Check indoor P.C. board error. • Check remote controller address setup. (When two remote controllers operate) • Check remote controller P.C. board.
E02	—	—	—	Remote controller	Remote controller sending error	Corresponding unit only stops.	Signal could not be sent from remote controller to indoor unit.	• Check the communication wire of remote controller: Exchange remote controller.
E03	—	—	97	Indoor unit	Communication error between indoor and remote controller (Detected at indoor side)	Corresponding unit only stops.	No communication from remote controller (including wireless) and communication adaptor.	• Check remote controller and communication adaptor wiring.
E04	—	—	4	Indoor unit	Indoor/outdoor communication circuit error (Detected at indoor side)	Corresponding unit only stops.	Indoor unit does not receive communication from outdoor unit.	• Check power-ON order of indoor/outdoor. • Check indoor address setup. • Check inter-unit cabling between indoor and outdoor. • Check outdoor end terminal resistance setup (SW30-2).
E06	E06	No. of indoor units which received signal normally	4	I/F	Decreased number of indoor units	All stop	When signal is not sent for a certain period from the indoor unit which has been used to send signals, [E06] is normally displayed.	• Check the power supply of indoor unit. (Power-ON) • Check connection of communication line between indoor and outdoor. • Check connector connection for communication in indoor P.C. board. • Check connector connection for communication in outdoor P.C. board. • Check indoor P.C. board failure. • Check outdoor P.C. board (I/F) failure.
—	E07	—	—	I/F	Indoor/outdoor communication circuit error (Detected at outdoor side)	All stop	Transmission from outdoor to indoor cannot continue for 30 seconds.	• Check outdoor end terminal resistance setup (SW30-2). • Check the communication connection between indoor and outdoor.
E08	E08	Duplicated indoor addresses	96	Indoor I/F	Duplicated indoor addresses	All stop	Multiple indoor unit address setup are duplicated.	• Check indoor address. • Check the change of remote controller connection (Group / individual) after setup of indoor address.
E09	—	—	99	Remote controller	Duplicated master remote controllers	Corresponding unit only stops.	In 2-remote controller control (including wireless), both are setup as master (Header indoor unit stops and other indoor unit is operating.)	• Check remote controller setup. • Check remote controller P.C. board.
E10	—	—	**CF**	Indoor unit	Communication error between indoor P.C. board assembly	Corresponding unit only stops.	There is any trouble in power line.	• Indoor P.C. board failure

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
E12	E12	01: Indoor/outdoor communication 02: Between outdoors communication	42	I/F	Automatic address start error	All stop	• When indoor automatic address started, other refrigerant circuit system was setting automatic address. • When outdoor automatic address started, indoor automatic address was executed.	• Setup the address again after disconnecting communication connection with other refrigerant circuit system.
E15	E15	—	42	I/F	No corresponding indoor unit during automatic address	All stop	Indoor unit is not found when indoor automatic address start was set up.	• Check the communication line connection between indoor and outdoor. • Check the electric power line error in indoor. • Check the noise of surrounding devices. • Power failure • Check indoor P.C. board error.
E16	E16	00: Capacity over 01 to: No. of connected units	89	I/F	No. of connected indoor units / Capacity over	All stop	• Total capacity of indoor units exceeded 135% of total outdoor capacity. • No. of connected indoor units are more than 48 units. **[Note]** If this code appears after backup setup of outdoor unit trouble, set up “No capacity-over detection”. **<Setup method of “No capacity-over detection”>** Turn on SW09/Bit 2 on I/F P.C. board of outdoor header unit.	• Check the connection capacity of indoor unit. • Check the HP capacity of indoor unit. • Check the indoor/outdoor capacity setup • Check the No. of connected indoor units. • Check the outdoor I/F P.C. board error
E18	—	—	97, 99	Indoor unit	Communication error between indoor header and follower units	Corresponding unit only stops.	Regular communication between indoor header and follower units .	• Check cable of the remote controller. • Check power cabling of indoor. • Check P.C. board of indoor.
E19	E19	00: No header unit 02: Two or more header units	96	I/F	Outdoor header unit quantity error	All stop	• There are multiple outdoor header units in 1 line. • There is none of outdoor header unit in 1 line.	The outdoor unit connected with communication cable between indoor and outdoor (U1.U2) is the outdoor header unit. • Check connection of communication line between indoor and outdoor. • Check outdoor P.C. board(I/F) error.
E20	E20	01: Connection of outdoor of other line 02: Connection of indoor of other line	42	I/F	Other line unit connected during automatic address	All stop	Unit of other line was connected when indoor automatic address started.	Separate the cable between lines according to automatic address setup method in “Address setup”.
E23	E23	—	15	I/F	Communication sending error between outdoor units	All stop	Transmission of other outdoor unit was unavailable for 30 seconds or more.	• Check the power of outdoor unit. (Is the power turned on?) • Check connection of communication wire or disconnection between outdoor units. • Check the connector for communication on outdoor P.C. board. • Check outdoor P.C. board (I/F) error. • Check the end terminal resistance setup for communication between outdoor units.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
E25	E25	—	15	I/F	Duplicated outdoor follower address setup	All stop	Outdoor addresses manually set up are duplicated.	**Note)** Do not set up the outdoor address manually.
E26	E26	No. of normally received outdoor units	15	I/F	Decreased number of connected outdoor units	All stop	The signal was not returned for constant from the outdoor unit which was receiving signal.	• Outdoor is performing backup. • Check the power of outdoor unit. (Is the power turned on?) • Check connection of inter-unit wire or disconnection between outdoor units. • Check the connector connection for communication on outdoor P.C. board. • Check outdoor P.C. board (I/F) error.
E28	E28	No. of detected outdoor units	d2	I/F	Outdoor follower unit error	All stop	Outdoor header unit received error code from outdoor follower unit.	• Check the check code of outdoor follower unit. **<Convenient functions>** When pushing SW04 for 1 second or more under condition that [E28] is displayed on 7-segment display of outdoor header unit, the fan of outdoor unit which stopped abnormally starts rotating. If pushing SW04 and SW05 simultaneously, the fan of normal outdoor unit operates. When pushing SW05 singly, the operation of fan is cleared.
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 errors 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error or communication error between IPDU and I/F P.C. board or outdoor I/F P.C. board error	CF	I/F	IPDU communication error	All stop	Communication of each IPDU (P.C. board) in inverter box interrupted.	• Check connection of communication connector and disconnection between IPDU and I/F P.C. board. • Check outdoor P.C. board (I/F, IPDU, Fan IPDU) error. • Check external noise. • Check power supply P.C. board for fan error.
F01	—	—	OF	Indoor unit	Indoor TCJ sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection/cabling of TCJ sensor connector. • Check characteristics of TCJ sensor resistance value. • Check indoor P.C. board error.
F02	—	—	Od	Indoor unit	Indoor TC2 sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection/cabling of TC2 sensor connector. • Check characteristics of TC2 sensor resistance value. • Check indoor P.C. board error.
F03	—	—	93	Indoor unit	Indoor TC1 sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection/cabling of TC1 sensor connector. • Check characteristics of TC1 sensor resistance value. • Check indoor P.C. board error.
F04	F04	—	19	I/F	TD1 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TD1 sensor connector. • Check characteristics of TD1 sensor resistance value. • Check outdoor P.C. board (I/F) error.
F05	F05	—	A1	I/F	TD2 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TD2 sensor connector. • Check characteristics of TD2 sensor resistance value. • Check outdoor P.C. board (I/F) error.
F06	F06	—	18	I/F	TE1 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TE1 sensor connector. • Check characteristics of TE1 sensor resistance value. • Check outdoor P.C. board (I/F) error.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
F07	F07	—	18	I/F	TL sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TL sensor connector. • Check characteristics of TL sensor resistance value. • Check outdoor P.C. board (I/F) error.
F08	F08	—	1b	I/F	TO sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TO sensor connector. • Check characteristics of TO sensor resistance value. • Check outdoor P.C. board (I/F) error.
F10	—	—	OC	Indoor	Indoor TA sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection/cabling of TA sensor connector. • Check characteristics of TA sensor resistance value. • Check indoor P.C. board error.
F12	F12	—	A2	I/F	TS1 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TS1 sensor connector. • Check characteristics of TS1 sensor resistance value. • Check outdoor P.C. board (I/F) error.
F13	F13	01: Compressor 1 side 02: Compressor 2 side	43	IPDU	TH sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• IGBT built-in temp sensor error → Exchange IPDU P.C. board.
F15	F15	—	18	I/F	Outdoor temp sensor miscabling (TE1, TL)	All stop	During operation of compressor in HEAT mode, the TE1 detection temp was higher than that of TL by the specified value continued for 3 minutes or more.	• Check installation of TE1 sensor and TL sensor. • Check characteristics of TE1 and TL sensor resistance value. • Check outdoor P.C. board (I/F) error.
F16	F16	—	43	I/F	Outdoor pressure sensor miscabling (Pd, Ps)	All stop	High-pressure Pd sensor and low-pressure Ps sensor were exchanged, or output voltages of both sensors are zero.	• Check connection of high-pressure Pd sensor connector. • Check connection of low-pressure Ps sensor connector. • Check pressure sensors Pd and Ps error. • Check outdoor P.C. board (I/F) error. • Check compression error of compressor.
F23	F23	—	43	I/F	Ps sensor error	All stop	Output voltage of Ps sensor was zero.	• Misconnection of Ps sensor and Pd sensor connectors • Check connection of Ps sensor connector. • Check Ps sensor error. • Check compression error of compressor. • Check 4-way valve error. • Check outdoor P.C. board (I/F) error. • Check SV4 circuit error.
F24	F24	—	43	I/F	Pd sensor error	All stop	Output voltage of Pd sensor was zero. (Sensor Open) Pd > 4.15MPa during stop of compressor	• Check connection of Pd sensor connector. • Check Pd sensor error. • Check outdoor P.C. board (I/F) error.
F29	—	—	12	Indoor	Indoor other error	Corresponding unit only stops.	Indoor P.C. board did not operate normally.	• Check indoor P.C. board error (EEPROM error).
F31	F31	—	1C	I/F	Outdoor EEPROM error	All stop (∗1)	Outdoor P.C. board (I/F) did not operate normally.	• Check power voltage. • Check power noise. • Check outdoor P.C. board (I/F) error.
H01	H01	01: Compressor 1 side 02: Compressor 2 side	1F	IPDU	Compressor breakdown	All stop	Inverter current detection circuit detected over-current and stopped.	• Check power voltage. (AC220–240V ± 10%). • Check compressor error. • Check cause of abnormal overload operation. • Check outdoor P.C. board (IPDU) error.

(∗1) All stop only in case of the header unit The follower unit continues operation.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
H02	H02	01: Compressor 1 side 02: Compressor 2 side	1d	IPDU	Compressor error (lock) MG-SW error OCR operation	All stop	Over-current was detected several seconds after header compressor had started.	• Check compressor error. • Check power voltage. (AC380 –10%, 415V +10%). • Check cable of compressor and phase-missing. • Check connector/terminal connection on IPDU P.C. board. • Check conduction of case heater. (Check activation error due to liquid stagnation in compressor.) • Check outdoor P.C. board (IPDU) error. • Check outdoor MG-SW or OCR.
H03	H03	01: Compressor 1 side 02: Compressor 2 side	17	IPDU	Current detection circuit system error	All stop	While header compressor stopped, current flowed more than the specified current and was detected.	• Check cabling of current detection circuit system. • Check outdoor P.C. board (IPDU) error.
H04	H04	—	44	I/F	Compressor 1 case thermo operation	All stop	Compressor 1 case thermo-stat performed protective operation.	• Check compressor 1 case thermo circuit. (Connector, cable, P.C. board) • Check full opening of service valve. (Gas and liquid side) • Check outdoor PMV clogging. (PMV1, 2) • Check SV41 circuit leakage. • Check miscabling/misinstallation of SV41 and SV42. • Check valve open status of indoor PMV. • Check compressor error. • Check 4-way valve error. • Check refrigerant shortage.
H06	H06	—	20	I/F	Low-pressure protective operation	All stop	Low-pressure Ps detected operation lower than 0.02MPa.	• Check full opening of service valve. (Gas and liquid side) • Check outdoor PMV clogging. (PMV1, 2) • Check SV41 circuit and SV42 circuit error. • Check low-pressure Ps sensor error. • Check indoor air filter clogging. • Check valve open of indoor PMV. • Check refrigerant pipe clogging. • Check outdoor fan operation. (In heating mode) • Check refrigerant shortage.
H07	H07	—	d7	I/F	Protection for oil level drop detection	All stop	The operating compressor detected oil shortage continuously for 2 hours.	**<Check all the outdoor units in the corresponding line.>** • Check full opening of service valve of balance pipe. • Check connection and installation of TK1, TK2, TK3, and TK4 sensors. • Check characteristics of TK1, TK2, TK3, and TK4 resistance values. • Check gas leak and oil leak in the same line. • Check refrigerant stagnation in compressor. • Check error of SV3A, SV3B, SV3C, SV3D, and SV3E valves. • Check clogging of oil separator oil return circuit. • Check clogging of oil-equation circuit.

MG-SW : Magnet Switch
OCR : Over-current Relay

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	I/F	Oil level detective temp sensor error	All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK1 sensor connector. • Check characteristics of TK1 sensor resistance value. • Check outdoor P.C. board (I/F) error.
						All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK2 sensor connector. • Check characteristics of TK2 sensor resistance value. • Check outdoor P.C. board (I/F) error.
						All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK3 sensor connector. • Check characteristics of TK3 sensor resistance value. • Check outdoor P.C. board (I/F) error.
						All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK4 sensor connector. • Check characteristics of TK4 sensor resistance value. • Check outdoor P.C. board (I/F) error.
H14	H14	—	44	I/F	Compressor 2 case thermo operation	All stop	Compressor 2 case thermostat operated.	• Check compressor 2 case thermo circuit. (Connector, cable, P.C. board) • Check full opening of service valve. (Gas and liquid side) • Check outdoor PMV clogging. (PMV1, 2) • Check SV42 valve leak. • Check miscabling/misinstallation of SV41 and SV42. • Check valve opening of indoor PMV. • Check 4-way valve error. • Check refrigerant shortage. • Check compressor error.
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	I/F	Oil level detective circuit system error MG-SW error OCR operation	All stop	Temperature change of TK1 could not be detected though compressor 1 started the operation.	• Check TK1 sensor coming-off. • Check characteristics of TK1 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check operation error of SV3E valve. • Check capillary clogging of oil-equation circuit and operation error of stop valve. • Check refrigerant stagnation in compressor. • Check MG-SW or OCR.
							Temperature change of TK2 could not be detected though compressor 2 started the operation.	• Check TK2 sensor coming-off. • Check characteristics of TK2 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check SV3E valve operation. • Check capillary clogging of oil equalization circuit and check stop valve operation. • Check refrigerant stagnation in compressor shell. • Check MG-SW or OCR.
							Temperature change of TK3 could not be detected though compressor started the operation.	• Check TK3 sensor coming-off. • Check characteristics of TK3 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check SV3E valve operation. • Check capillary clogging of oil-equalization circuit and check valve operation. • Check refrigerant stagnation in compressor shell. • Check MG-SW or OCR.
							Temperature change of TK4 could not be detected though compressor started the operation, or the difference from other TK sensor changed for a constant time only within the specified range.	• Check TK4 sensor coming-off. • Check characteristics of TK4 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check SV3E valve operation. • Check capillary clogging of oil-equalization circuit and check valve operation. • Check refrigerant stagnation in compressor shell. • Check MG-SW or OCR.

MG-SW : Magnet Switch
OCR : Over-current Relay

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
L03	—	—	96	Indoor	Duplicated indoor center units	Corresponding unit only stops.	There are multiple center units in a group.	• Check indoor address. • Check the change of remote controller connection (Group/individual) after indoor address setup.
L04	L04	—	96	I/F	Duplicated outdoor line address	All stop	Line address setup is duplicated against the outdoor unit in different refrigerant pipe system.	• Check line address.
L05	—	—	96	I/F	Duplicated indoor units with priority (Displayed on indoor unit with priority)	All stop	Indoor units with priority were duplicated.	• Check display of indoor unit with priority.
L06	L06	No. of indoor units with priority	96	I/F	Duplicated indoor units with priority (Displayed on the unit other than indoor unit with priority)	All stop	Indoor units with priority were duplicated.	• Check display of indoor unit with priority and outdoor unit.
L07	—	—	99	Indoor	Group line in individual indoor unit.	Corresponding unit only stops.	At least one indoor unit connected to a group existed in the individual indoor units.	• Check indoor address.
L08	L08	—	99	Indoor	Indoor group / address unset	Corresponding unit only stops.	Address was not yet set up.	• Check indoor address. **Note)** After installation, this code is displayed when the power is firstly turned on.
L09	—	—	46	Indoor	Indoor capacity unset	Corresponding unit only stops.	Indoor unit capacity was unset.	Set up indoor capacity. (DN=11)
L10	L10	—	88	I/F	Outdoor capacity unset	All stop	On the I/F P.C. board for service, jumper line was not cut according to the model.	Check model setup on outdoor I/F P.C. board A'ssy for service.
L20	—	—	98	AI-NET, Indoor	Duplicated central control addresses	All stop	Duplicated central control addresses	• Check central control address. • Check network adaptor P.C. board. (In case of AI-NET)
L28	L28	—	46	I/F	Quantity over of connected outdoor units	All stop	There were more than four outdoor units.	• Check No. of connected outdoor units. (Max. 4 units per 1 system) • Check communication line between outdoor units. • Check outdoor P.C. board (I/F) error.
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 errors 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error or communication error between IPDU and I/F P.C. board, or outdoor I/F P.C. board error	CF	I/F	IPDU quantity error	All stop	No. of IPDU units detected when power was turned on were less.	• Check model setup for outdoor I/F service P.C. board. • Check connection of UART communication connector. • Check IPDU, fan IPDU, and I/F P.C. board error. **Note)** UART: Universal Asynchronous Receiver Transmitter

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
L30	L30	Detected indoor address	b6	Indoor	Interlock in indoor unit from outside	Corresponding unit only stops.	• Outside error input terminal Detected signal to (CN80) for more 1 minute	■ Outside device is connected to connector (CN80): 1) Check outside device error. 2) Check indoor P.C. board error. ■ Outside device is not connected to connector (CN80): 1) Check indoor P.C. board error.
—	L31	—	—	I/F	Extended IC (Integrated Circuit) error	Operation continues.	P.C. board (I/F) parts error	Check indoor (I/F) P.C. board.
P01	—	—	11	Indoor	Indoor fan motor error	Corresponding unit only stops.		• Check the lock of fan motor (AC fan). • Check cabling.
P03	P03	—	1E	I/F	Discharge temp TD1 error	All stop	Discharge temp (TD1) exceeded 115°C.	• Check full opening of outdoor service valves (Gas side, Liquid side). • Check clogging of outdoor PMV. (PMV1,2) • Check characteristics of TD1 sensor resistance value. • Check refrigerant shortage. • Check 4-way valve error. • Check leakage of SV41 circuit. • Check SV4 circuit. (Miscabling and misinstallation of SV41 and SV42)
P04	P04	01: Compressor 1 side 02: Compressor 2 side	21	I/F	Actuation of high-pressure SW	All stop	High-pressure SW actuated.	• Check Pd pressure sensor error. • Check full opening of outdoor service valves (Gas side, Liquid side). • Check outdoor fan error. • Check outdoor fan motor error. • Check clogging of outdoor PMV. (PMV1,2) • Check clogging of indoor/outdoor heat exchangers. • Check short-circuiting of outdoor suction/discharge air. • Check clogging of SV2 circuit. • Check outdoor P.C. board (I/F) error. • Check indoor fan system error. (Cause of air volume decrease) • Check opening of indoor PMV. • Check miscabling of communication line between indoor and outdoor. • Check operation error of check valve of discharge pipe. • Check SV4 valve circuit. • Check SV5 valve circuit. • Check refrigerant overcharge.
P05	P05	01: Power supply open phase 02: Power supply negative phase	AF	I/F	Open phase negative phase	All stop	• Open phase was detected when the power turned on. • Negative phase was detected when the power turned on.	• Check outdoor power line. • Check outdoor P.C. board (I/F) error.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P07	P07	01: Compressor 1 side 02: Compressor 2 side	1C	IPDU I/F	Heat sink overheat error	All stop	IGBT built-in temp sensor (TH) was overheated.	• Check power voltage. • Check outdoor fan system error. • Check clogging of heat sink cooling duct. • Check fixation between IGBT and heat sink. (Check screwing and contact.) • Check IPDU error.(IGBT built-in temp sensor (TH) error)
P10	P10	Indoor address with trouble	Ob	Indoor	Indoor overflow error	All stop	• Float switch operated. • Float switch circuit disconnected or the connector came off.	• Check the float switch connector. • Check operation of drain pump unit. • Check the drain pump circuit. • Check clogging of drain pipe. • Check indoor P.C. board error.
P12	—	—	11	Indoor	Indoor fan motor error	Corresponding unit only stops.	• The value of motor speed deviated from target value was detected for certain time. • Over-current protection operated.	• Check connection of fan connector and wiring. • Check fan motor error. • Check indoor P.C. board error. • Check influence of outside air control. • Check indoor type code (DN=10) and the capacity code (DN=11).
P13	P13	—	47	I/F	Outdoor liquid back detection error	All stop	**<In cooling>** While the system is operating in COOL mode, a high pressure value was detected in follower unit in which compressor did not operate. **<In heating>** While the system is operating in HEAT mode, outdoor PMV of which opening degree was 100p or less for a certain time.	• Check full close operation of outdoor PMV (1, 2). • Check Pd and Ps sensor error. • Check clogging of SV2 circuit. • Check clogging of balance pipe. • Check clogging of SV3B circuit. • Check outdoor P.C. board (I/F) error. • Check capillary clogging of oil return circuit from oil separator. • Check leakage of check valve of the main discharge pipe.
P15	P15	01: TS condition	AE	I/F	Gas leak detection (TS1 condition)	All stop	Suction temp exceeded the judgment standard temp for 10 minutes or more. **<TS error judgment standard temperature>** In cooling operation: 60°C or higher In heating operation: 40°C or higher	• Check refrigerant shortage. • Check full open of outdoor service valves (gas side, liquid side). • Check outdoor PMV clogging (PMV1, 2). • Check characteristics of TS1 sensor resistance value. • Check 4-way valve error. • Check leakage of SV4 circuit.
		02: TD condition	AE	I/F	Gas leak detection (TD condition)	All stop	Discharge temperature TD1 or TD2 was continuously 108°C or higher for 10 minutes.	• Check refrigerant shortage. • Check outdoor PMV clogging (PMV1, 2). • Check characteristics of TD1, TD2 sensor resistance value. • Check indoor air filter clogging. • Check pipe clogging. • Check SV4 circuit (Valve leakage, misinstallation)
P17	P17	—	bb	I/F	Discharge temp TD2 error	All stop	Discharge temperature (TD2) exceeded 115°C.	• Check full opening of outdoor service valves (gas side, liquid side). • Check clogging of outdoor PMV (PMV1, 2). • Check characteristics of TD2 sensor resistance value. • Check 4-way valve error. • Check leakage of SV42 circuit. • Check SV4 circuit. (Miscabling and misinstallation of SV41 and SV42)
P19	P19	Detected outdoor unit No.	8	I/F	4-way valve operation error	All stop	When abnormal refrigerating cycle data was detected in heating	• Error of 4-way valve error • Check coil error and connector connection of 4-way valve. • Check characteristics of TS1/TE1 sensor resistance value. • Check characteristics of Pd, Ps pressure sensor output voltage. • Check misconnection of TE1 and TL sensors.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P20	P20	—	22	I/F	High-pressure protective operation	All stop	Pd sensor detected 3.6MPa or more.	• Check Pd pressure sensor error. • Check full opening of service valves (Gas side, Liquid side). • Check outdoor fan error. • Check outdoor fan motor error. • Check clogging of outdoor PMV. (PMV1,2) • Check clogging of indoor/outdoor heat exchangers. • Check air short-circuiting in outdoor unit. • Check clogging of SV2 circuit. • Check outdoor P.C. board (I/F) error. • Check indoor fan system error. (Cause of air volume decrease) • Check valve opening of indoor PMV. • Check miscabling of communication line between indoor and outdoor. • Check operation error of check valve of discharge pipe. • Check circuit of gas balance SV4 valve. • Check circuit of SV5 valve. • Check refrigerant overcharge.
P22	P22	0: IGBT shortage 1: Position detection circuit error 3: Motor lock error 4: Motor current error detection C: TH sensor temp. error D: TH sensor error E: Vdc error	1A	FAN-IPDU	Outdoor fan IPDU error	All stop	**(Sub-code: 0)** • Short-circuit current was detected at start time. • Short-circuit current was detected when checking IGBT short-circuit before start time.	• Check fan motor. (Interphase short-circuit) • Check fan IPDU error.
						All stop	**(Sub-code: 1)** • The standard value of detection circuit of fan IPDU current fluctuated at start time.	• Check fan IPDU error.
						All stop	**(Sub-code: 3)** • Abnormal current was detected within 30 seconds after start time.	• Check fan motor. (Lock, phase missing) • Check cause of abnormal overload at start time. • Check connection of connector to fan motor.
						All stop	**(Sub-code: 4)** • Short-circuit current was detected when 2 seconds or more passed after start time. • Over-current was detected when 30 seconds or more passed after start time.	• Check power supply voltage. • Check fan IPDU error.
						All stop	**(Sub-code: C)** • Heat sink sensor (TH) of fan IPDU detected 95°C error.	• Check outdoor fan system. • Check fan IPDU error. • Check fixation between fan IPDU and heat sink.
						All stop	**(Sub-code: D)** • Heat sink sensor (TH) of fan IPDU detected short-circuiting or open.	• Check fan IPDU error.
						All stop	**(Sub-code: E)** • nput power supply voltage of the fan IPDU over the setup value was detected. • Input power supply terminal of the fan IPDU was unconnected. • Power supply P.C. board error of the fan IPDU	• Check input power supply voltage of the fan IPDU. • Check power supply P.C. board error of the fan IPDU. • Check error of external electrolytic condenser.

Main remote controller	Check code			Detected position	Check code name	Status	Error detection condition	Check item (position)
	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P26	P26	01: Compressor 1 side 02: Compressor 2 side	14	IPDU	G-Tr short-circuit protection error	All stop	Instantaneous over-current was detected when compressor started.	• Check connector connection and wiring on IPDU P.C. board. • Check compressor error and defect of compressor coil. • Check outdoor P.C. board (IPDU) error.
P29	P29	01: Compressor 1 side 02: Compressor 2 side	16	IPDU	Compressor position detection circuit error	All stop	Position was not normally detected.	• Check connector connection and wiring. • Check compressor error and defect of compressor coil. • Check P.C. board (IPDU) error.
P31	—	—	47	Indoor	Other indoor error (Group follower unit error)	Corresponding unit only stops.	E07/L07/L03/L08 was detected when other indoor unit in the group was defective.	• Check indoor P.C. board.

Error detected by TCC-LINK central control device

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Display on central control device	Outdoor 7-segment display		AI-NET central control remote controller					
		Sub-code						
C05	—		—	TCC-LINK	TCC-LINK central control device transmission error	Operation continued.	Signal is not transmit from central control device.	• Check central control device error. • Check communication line error of central control device. • Check setup of end terminal resistance.
C06	—		—		TCC-LINK central control device receiving error	Operation continued.	Signal is not received from central control device.	• Check central control device error. • Check communication line error of central control device. • Check setup of end terminal resistance. • Check the power of connecting destination connected device. • Check P.C. board error of the connected device.
C12	—		—	General-purpose device I/F	Interface batch alarm of general-purpose control devices	Operation continued.	Error was input in general-purpose control device control interface.	• Check error input.
P30	Differs according to error contents of the with alarm			TCC-LINK	Follower unit error of group control	Operation continued.	An error occurred in follower unit of the group control. ([P30] is displayed only on the central control remote controller.)	• Check the check code of the unit with alarm.
	(L20 is displayed.)				Duplicated central control address	Operation continued.	Central control addresses were duplicated.	• Check the address setup.

Error detected by AI-NET central control device

Main remote controller	Check code			Detected position	Check code name	Status	Error detection condition	Check item (position)
	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
—	—	—	97	AI-NET	AI-NET communication system error	Operation continued.	E07/L07/L03/L08 was detected when other indoor unit in the group was defective.	• Check multiple network adaptors. • Check wire and miscabling of remote controller: Only one network adaptor can be connected to communication line of remote controller.
—	—	—	99	AI-NET	Duplicated network adaptors	Operation continued.	Multiple network adaptors were connected to communication line of remote controller. (Detected at central controller side)	• Check communication line, miscabling, and power of indoor unit. • Check communication. (X, Y terminals) • Check network adaptor P.C. board. • Check the central controller (Central control remote controller, etc.)
—	—	—	b7	AI-NET	Error in indoor group	Operation continued.	Error of follower unit in the group	• Check follower unit in the group.

∗ These errors are concerned to communication of remote controllers (A, B) and central system [AI-NET X, Y], and the main remote controller displays [E01], [E02], [E03], [E09], or [E18] in some cases and displays none in other cases according to the contents.

Cautions when servicing for compressor

1. Removing wires of both compressors check output of the inverter as described below.

How to check inverter output

1. Turn off the power supply.
2. Remove the compressor lead cables from the compressors.
   (Be sure to remove lead cables of both compressors.)
3. Turn on the power supply and start cooling or heating operation.
   In this time, pay attention to touch the fasten receptacle terminal lug of the compressor leads so that they do not contact with other fasten receptacle terminal lug or other position (unit cabinet, etc.).
4. Check output voltage of compressor lead cable at inverter side.
   When the output voltage does not satisfy the criteria in the following table, replace IPDU P.C. board.

No.	Measured position	Criteria
1	Between Red and White	400 V to 650 V
2	Between White and Black	400 V to 650 V
3	Between Black and Red	400 V to 650 V

* After checking the output, when connecting the compressor lead again to the compressor terminal, check surely there is no distortion on the fasten terminal lug. If it is loosened, caulk it with pinchers, etc and then connect lead to the terminal.

How to check resistance of compressor winding

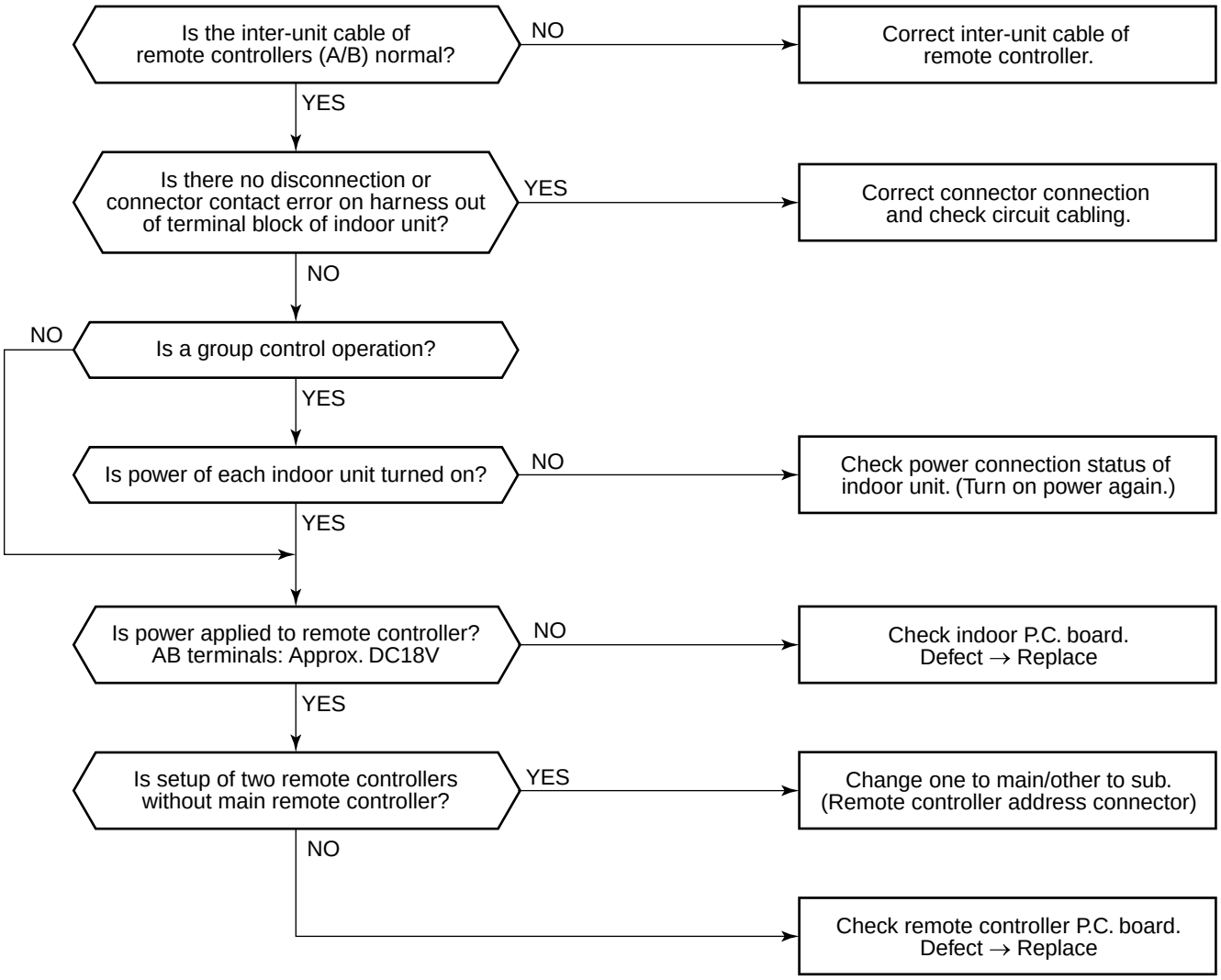
1. Turn off the power supply.
2. Remove the compressor lead cables from the compressors.
   In each compressor, check the winding resistance between phases and resistance of the outdoor cabinet using a tester.
   - Is not it earthed?
     → Normal if 10MΩ or more are measured
   - Is not shorted between windings?
     → Normal if 0.7Ω to 0.9Ω are measured (Use a precise digital tester.)

How to check the external fan motor

1. Turn off the power supply.
2. Take off three connectors (U.V.W) from the external fan IPDU P.C. board.
3. Turn the fan with hands. If the fan does not turn, it is a fan motor error (Lock). Replace the fan motor.
   If the fan turns, measure the winding resistance between the phases of the connector (Motor winding) with a tester. If 13 to 33Ω are measured, it is normal. (Use a digital tester.)

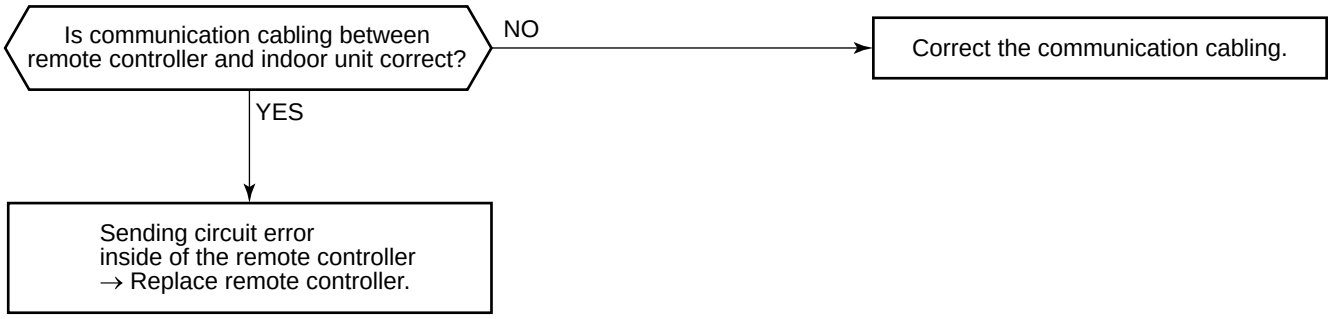
9-5. Diagnosis Procedure for Each Check Code

Check code	Check code name	Cause of operation
[E01] / [–] (d07 / AI-NET)	**Communication error between indoor and remote controller (Detected at remote controller side)**	1. Remote controller inter-unit cable error 2. Indoor power error 3. Indoor P.C. board error 4. Remote controller address setup error 5. Remote controller P.C. board error



Check code	Check code name	Cause of operation
[E02] / [–] (d07 / AI-NET)	**Remote controller sending error**	Signal could not be sent to indoor unit. Check the communication wire of the remote controller.

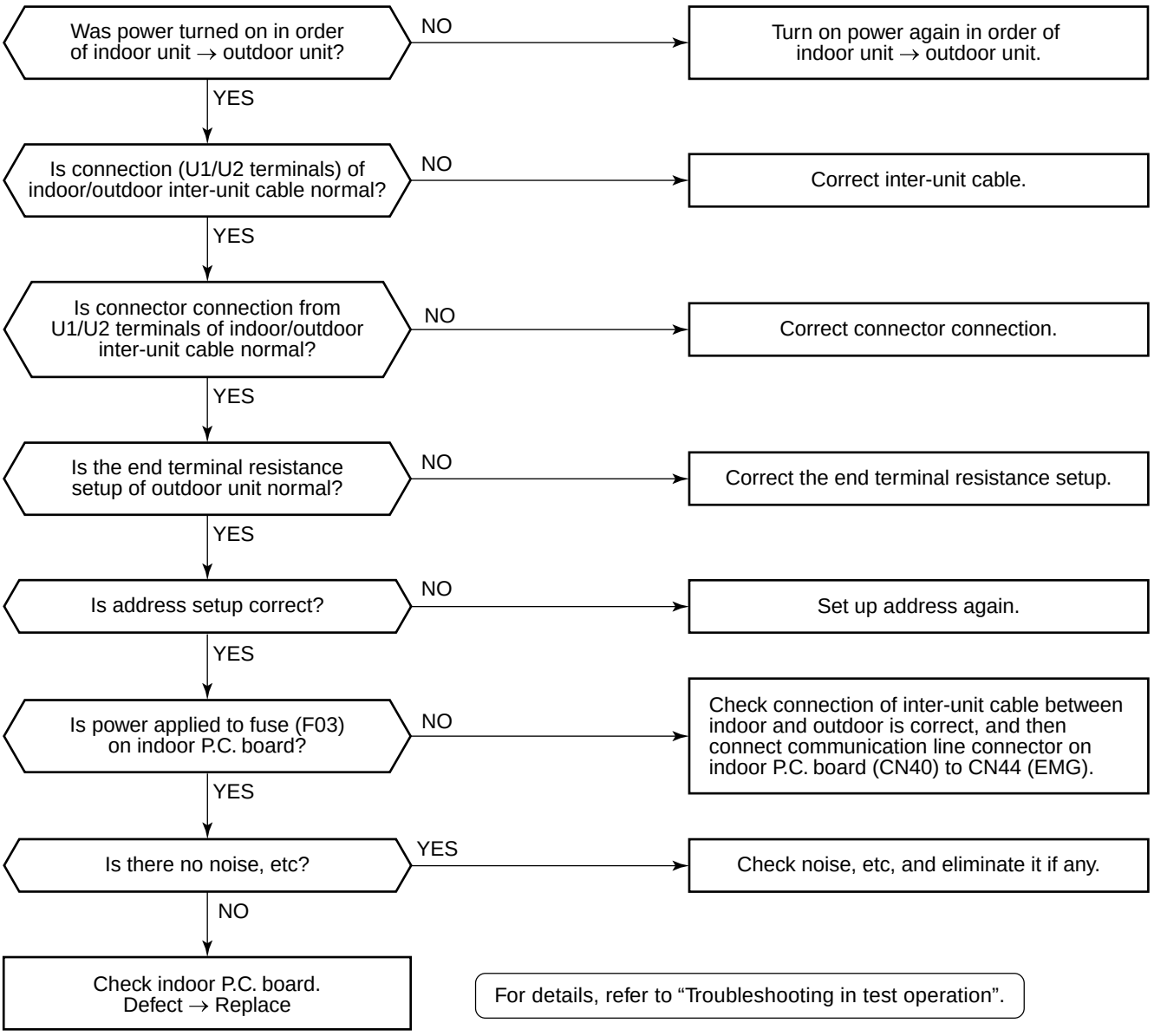
* It is not displayed on 7-segment display of the central control controller.



Check code	Check code name	Cause of operation
[E03] / [97] (d07 / AI-NET)	**Communication error between indoor and remote controller (Detected at indoor side)**	No communication from remote controller and communication adaptor

This error is detected when the indoor unit cannot receive a signal from the remote controller.
Check communication cables of the remote controllers A and B.
As communication is impossible, this check code [E03] is not displayed on the main remote controller.
It is displayed on TCC-LINK central controller.

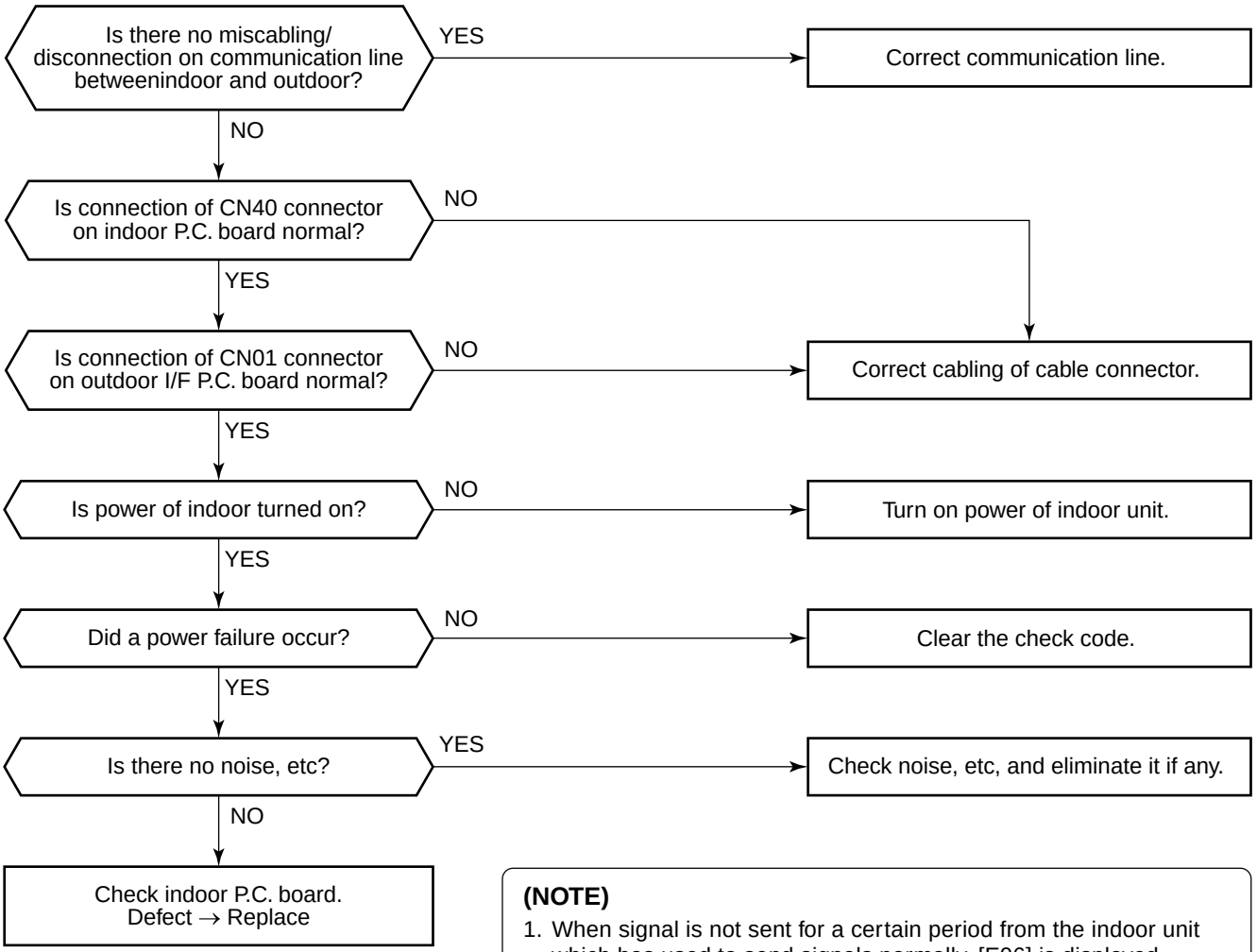
Check code	Check code name	Cause of operation
[E04] / [04] (d07 / AI-NET)	**Indoor/Outdoor communication circuit error (Detected at indoor side)**	1. Power of outdoor unit was firstly turned on. 2. Connection error of communication line between indoor and outdoor 3. End terminal resistance setup error on communication between indoor and outdoor 4. Address setup error



For details, refer to “Troubleshooting in test operation”.

Check code	Check code name	Cause of operation
[E06] / [04] (d07 / AI-NET)	**Decreased number of indoor units**	1. Communication lines (U1, U2) connection error between indoor and outdoor 2. Connector connection error of communication for indoor P.C. board 3. Connector connection error of communication for outdoor I/F board 4. Power supply of indoor unit (Is power turned on?)

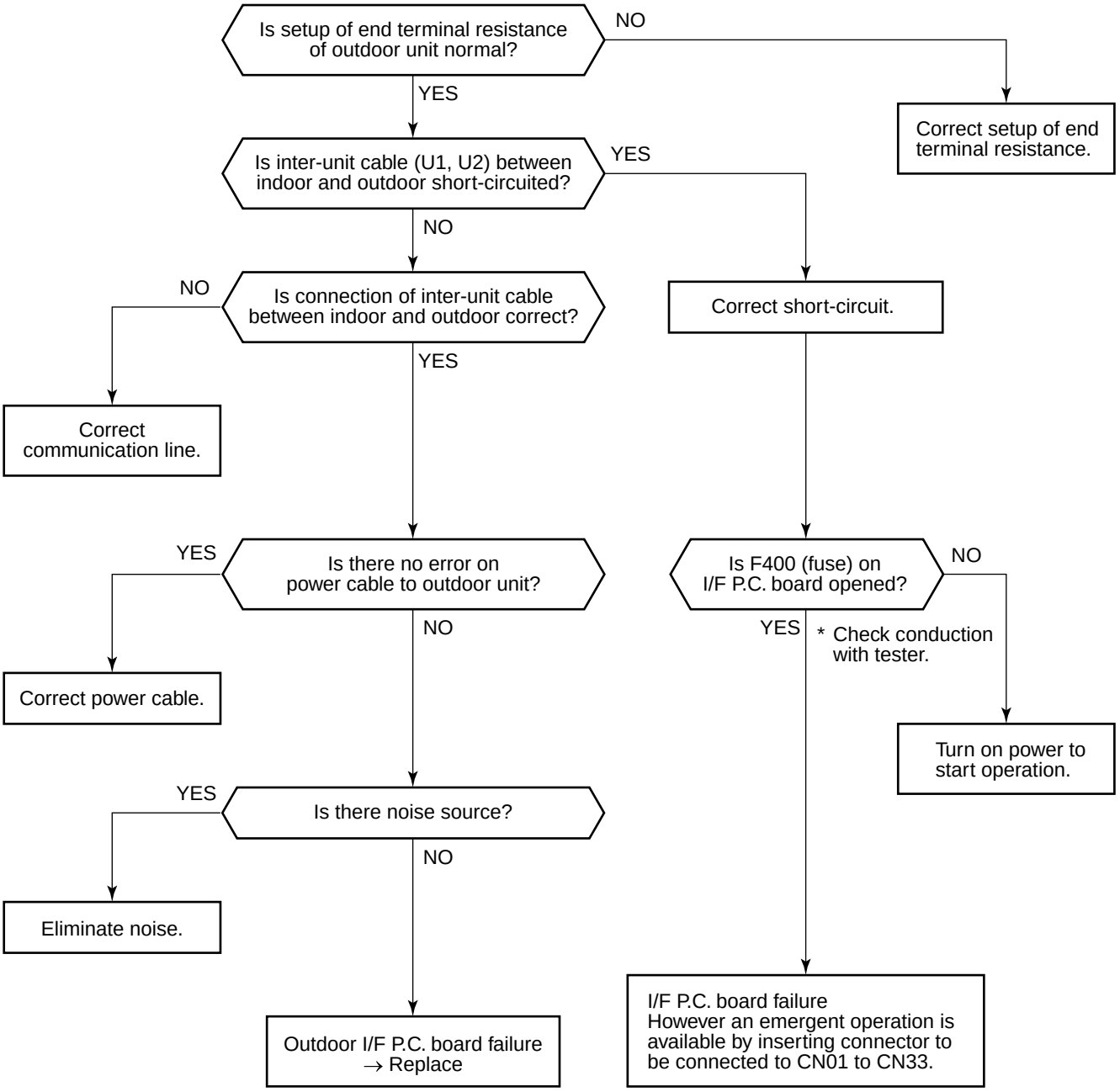
Sub-code: No. of indoor units which received signals normally



(NOTE)

1. When signal is not sent for a certain period from the indoor unit which has used to send signals normally, [E06] is displayed.

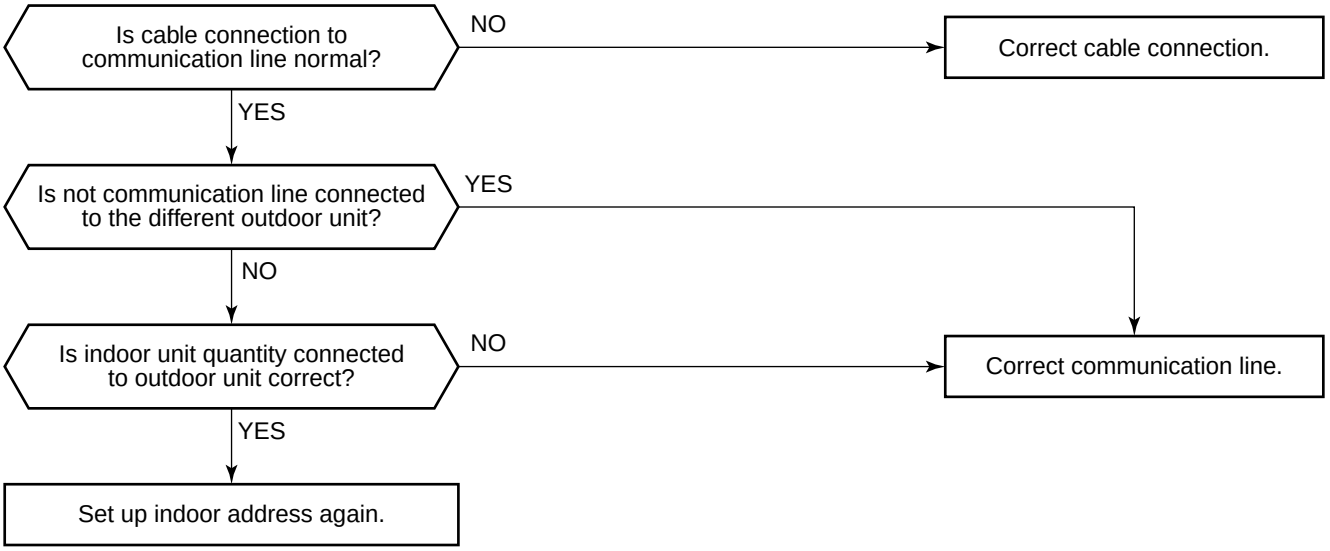
Check code	Check code name	Cause of operation
[E07] / [–] (d07 / AI-NET)	**Indoor/Outdoor communication circuit error (Detected at outdoor side)**	1. Indoor/outdoor communication end terminal resistance setup error 2. Indoor/outdoor communication connection error



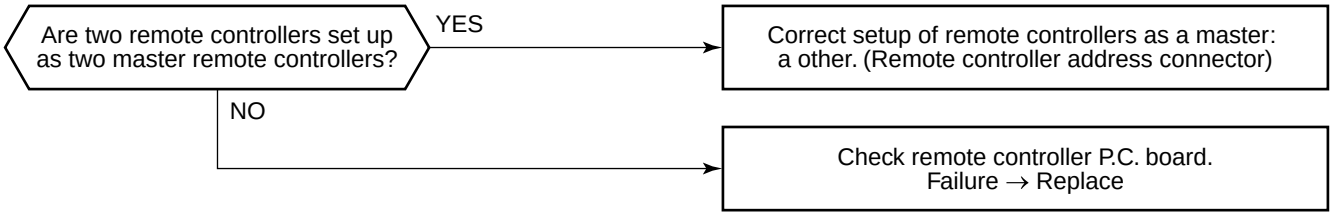
Check code	Check code name	Cause of operation
[E08] / [96] (d07 / AI-NET)	**Duplicated indoor addresses**	Indoor addresses are duplicated.

Sub-code: Duplicated indoor address

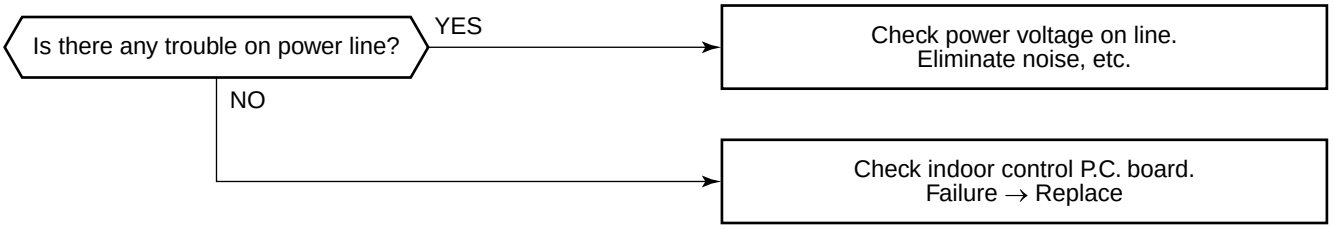
Using a main remote controller (RBC-AMT21E), check the setup item codes (DN code) 12, 13, and 14.
When there is no address duplication, check to the following flowchart.



Check code	Check code name	Cause of operation
[E09] / [99] (d07 / AI-NET)	**Duplicated master remote controller**	Setup of master remote controller is duplicated.

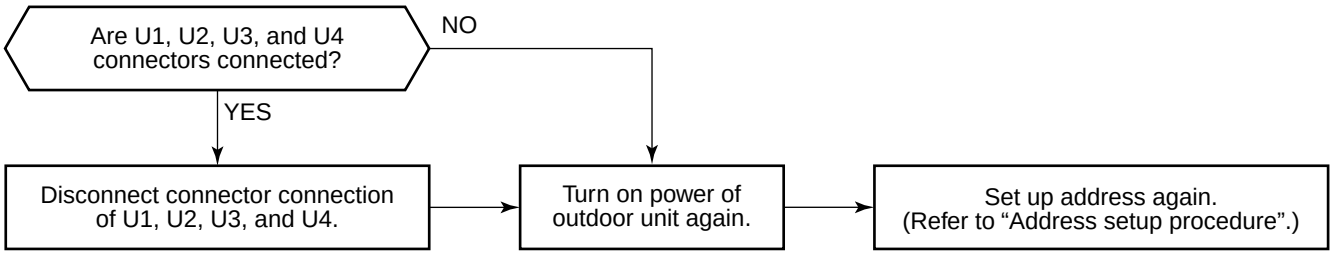


Check code	Check code name	Cause of operation
[E10] / [CF] (d07 / AI-NET)	**Communication error in indoor P.C. board A'ssy**	Indoor P.C. board error A'ssy failure

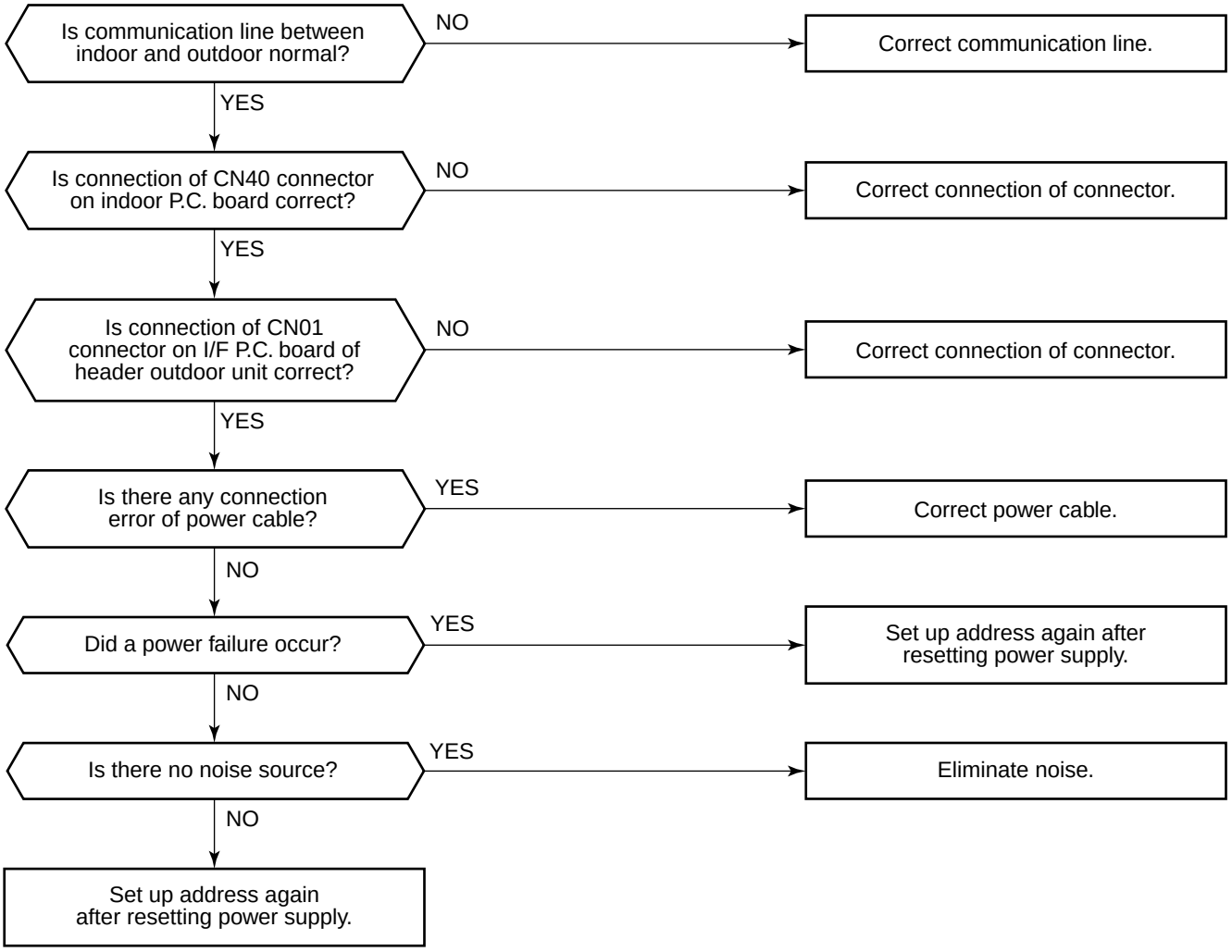


Check code	Check code name	Cause of operation
[E12] / [42] (d07 / AI-NET)	**Automatic address start error**	1. When indoor automatic address started, other refrigerant circuit system was setting automatic address. 2. When outdoor automatic address started, the indoor automatic address was being set. (Sub-code: 02)

Sub-code: 01: Communication between indoor and outdoor 02: Communication between outdoor units

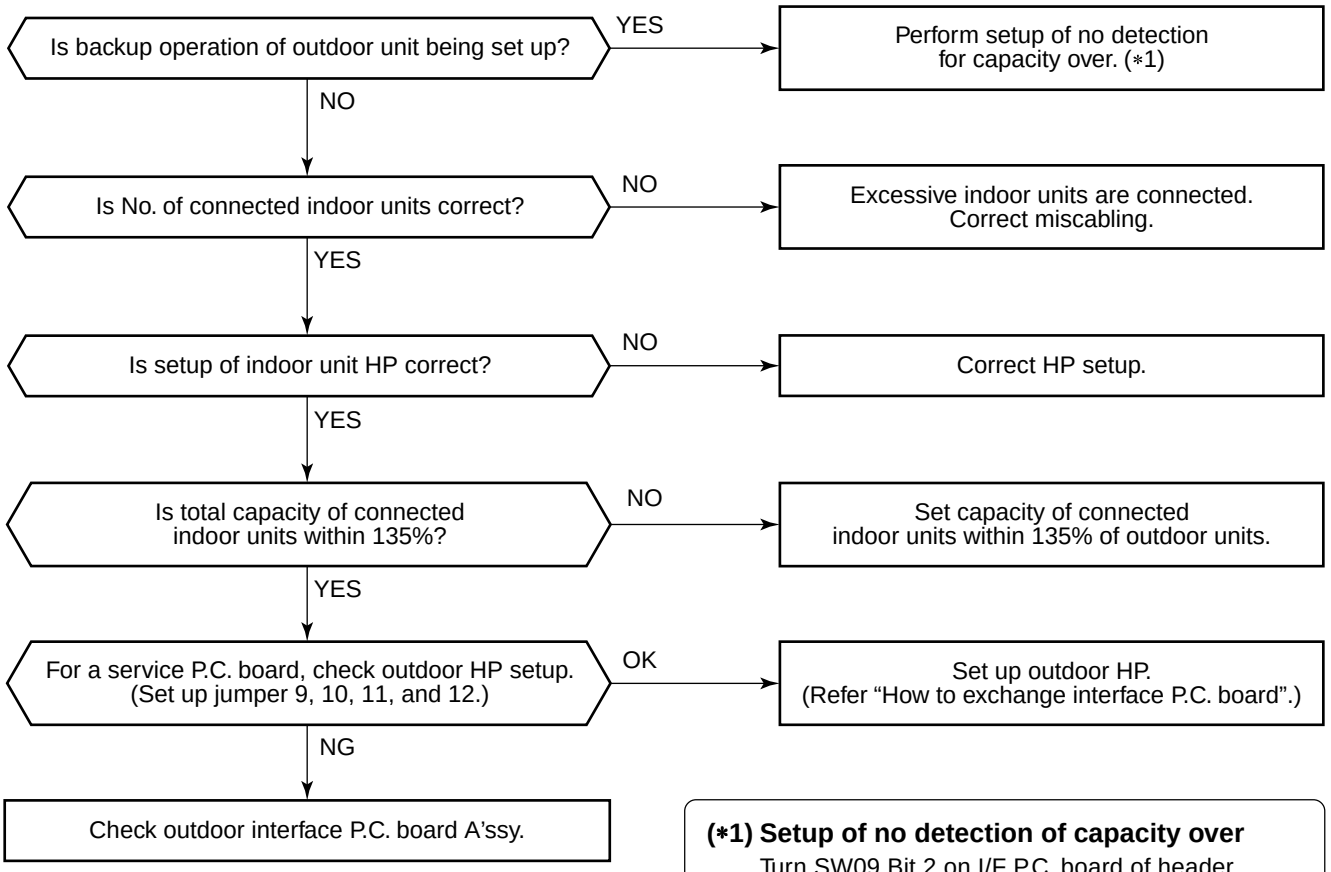


Check code	Check code name	Cause of operation
[E15] / [42] (d07 / AI-NET)	**No corresponding indoor unit during automatic address**	1. Communication line connection error between indoor and outdoor. 2. Indoor power system error 3. Noise from surrounding devices 4. Power failure 5. Indoor P.C. board error



Check code	Check code name	Cause of operation
[E16] / [89] (d07 / AI-NET)	**Connected indoor units capacity over**	1. There are 48 or more connected indoor units. 2. Capacity over of total connected indoor units. 3. Incorrect setup of indoor/outdoor capacity

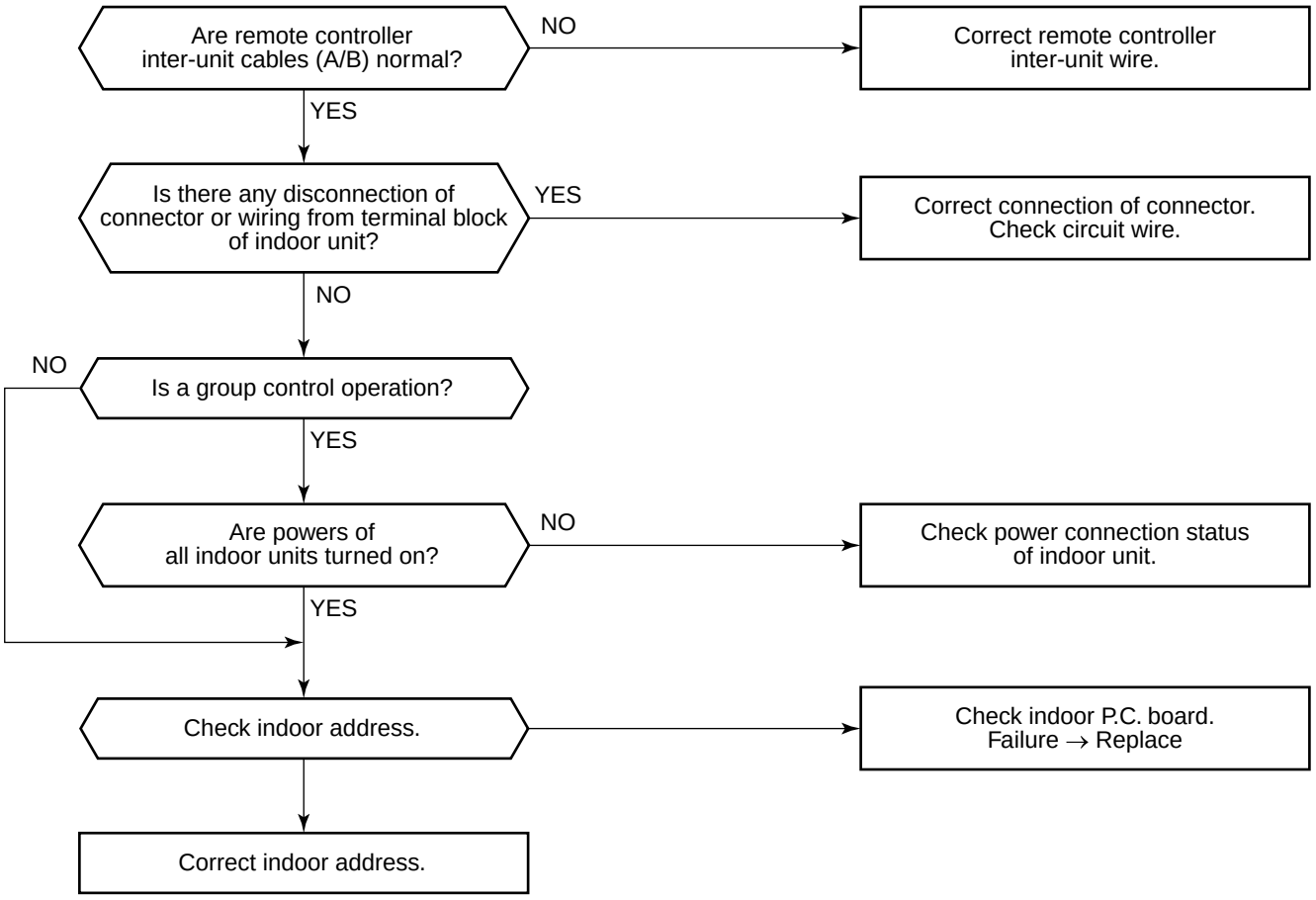
Sub-code: 00 : Capacity over 49 to 64 of connected units



(∗1) Setup of no detection of capacity over

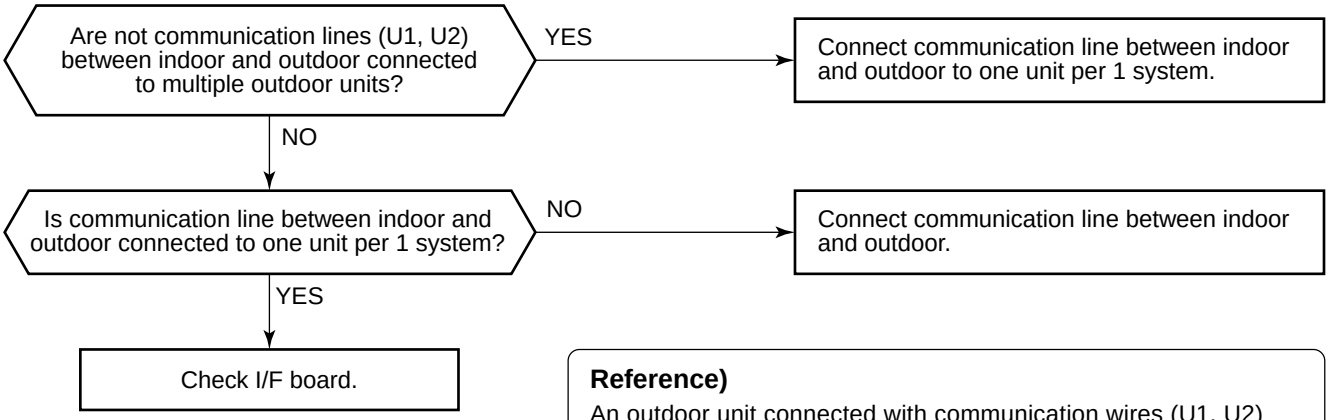
Turn SW09 Bit 2 on I/F P.C. board of header outdoor unit to ON. (Usually OFF)

Check code	Check code name	Cause of operation
[E18] / [97/99] (d07 / AI-NET)	**Communication error between indoor header and follower**	Regular communication between indoor header and follower is unavailable.



Check code	Check code name	Cause of operation
[E19] / [96] (d07 / AI-NET)	**Header outdoor units quantity error**	1. Misconnection of inter-unit cable between indoor and outdoor 2. Outdoor I/F P.C. board error

Sub-code: 00: No header unit 02: Two or more header units



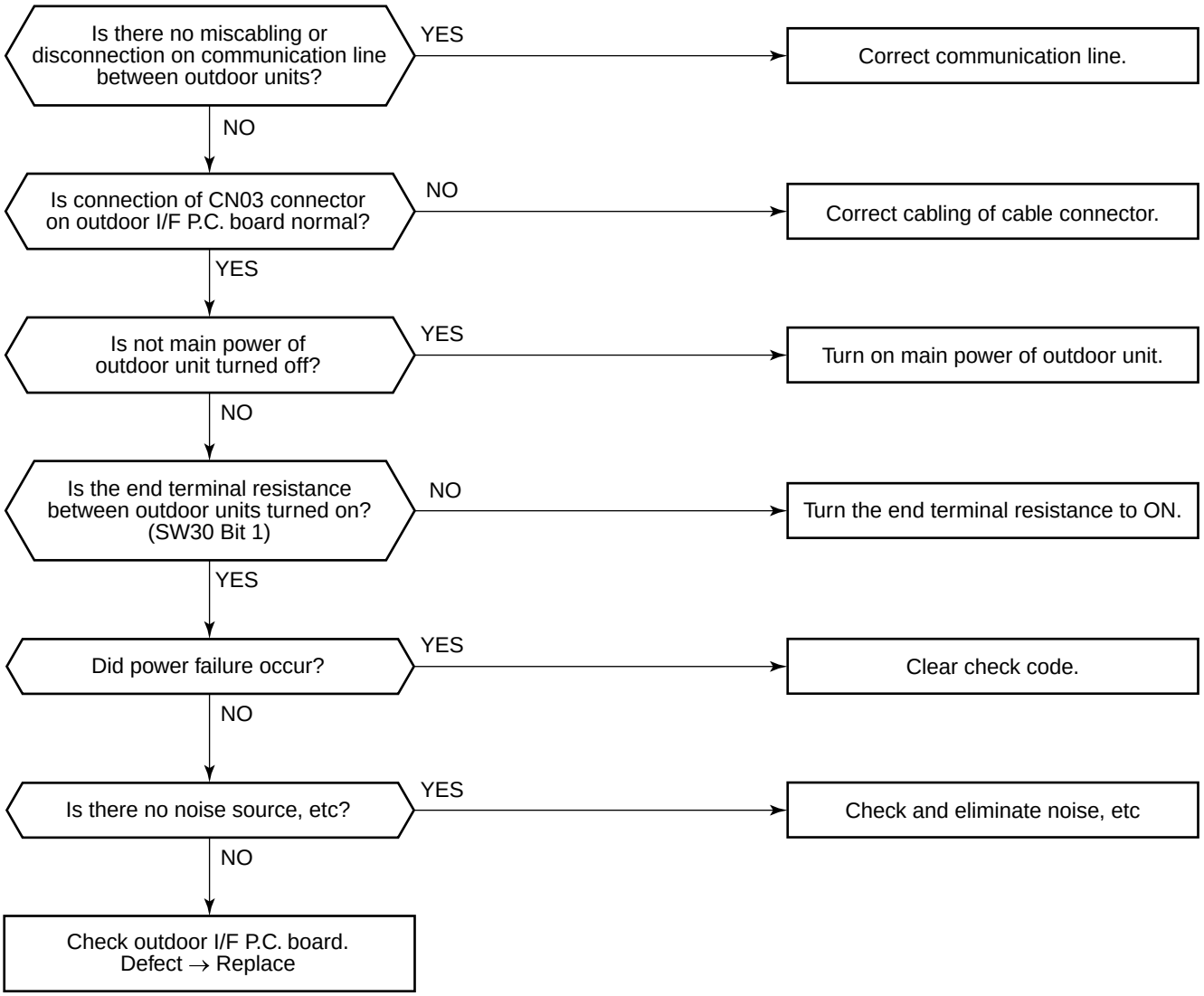
Reference)
An outdoor unit connected with communication wires (U1, U2) between indoor and outdoor is the header unit.

Check code	Check code name	Cause of operation
[E20] / [42] (d07 / AI-NET)	**Unit connected to other line during automatic address**	When starting automatic indoor address, a device in other line is connected.

Sub-code: 01: Connection of outdoor in other line 02: Connection of indoor unit in other line

Separate the wire between lines according to address setup method.

Check code	Check code name	Cause of operation
[E23] / [15] (d07 / AI-NET)	**Communication sending error between outdoor units**	1. Inter-unit cable connection error between outdoor units 2. Communication connector connection error between outdoor units, I/F P.C. board error 3. End terminal resistance setup error between outdoor units

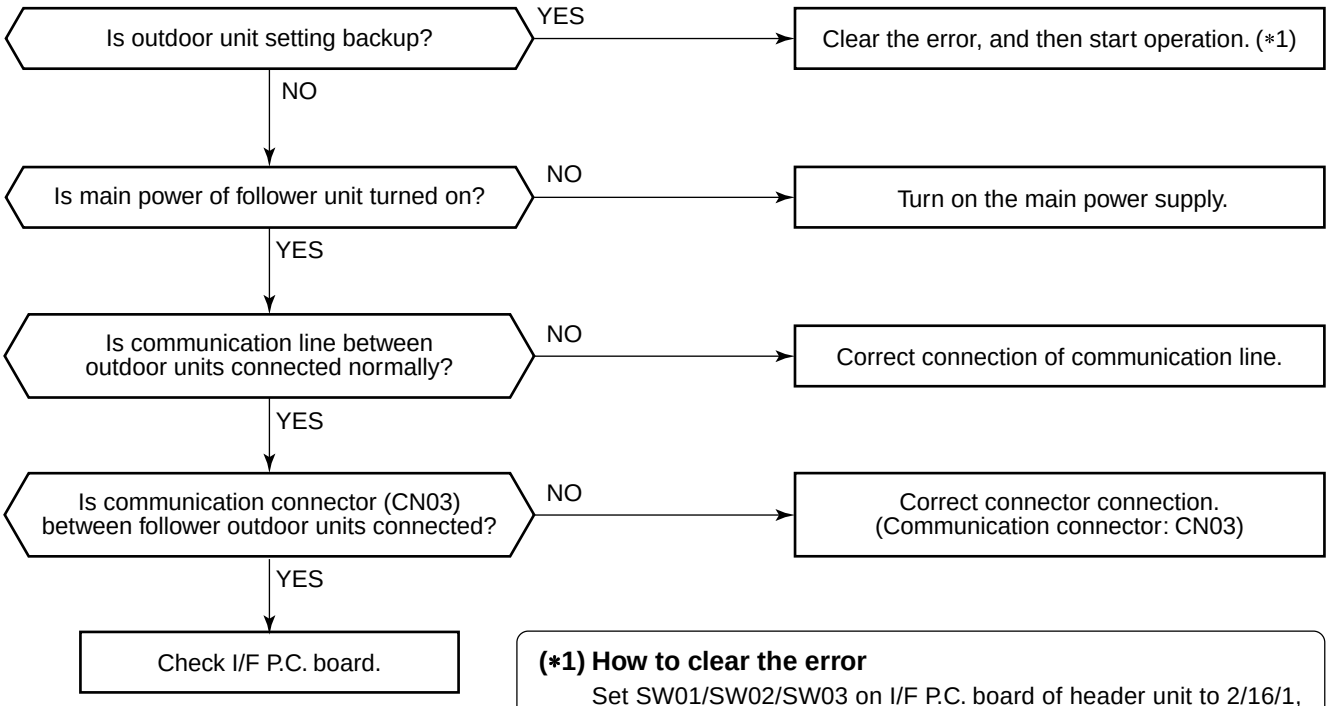


Check code	Check code name	Cause of operation
[E25] / [15] (d07 / AI-NET)	**Duplicated follower outdoor address setup**	Addresses are duplicated by manual setup of outdoor address

Do not set up outdoor address manually.

Check code	Check code name	Cause of operation
[E26] / [15] (d07 / AI-NET)	**Decrease of connected outdoor units**	1. Outdoor unit backup setup 2. Outdoor power error 3. Communication line connection error between outdoor units 4. Connector connection error for communication 5. Outdoor I/F P.C. board error

Sub-code: No. of outdoor units which received signals normally



(∗1) How to clear the error

Set SW01/SW02/SW03 on I/F P.C. board of header unit to 2/16/1, and push SW04 for 5 seconds or more.
(7-segment display: [Er.] [CL])

Check code	Check code name	Cause of operation
[E28] / [d2] (d07 / AI-NET)	**Follower outdoor unit error**	Follower outdoor error

Sub-code: Detected outdoor unit No.

An error occurred on the follower unit. Check the check code of follower unit on 7-segment display on I/F P.C. board of follower unit, and then check according to Diagnose procedure for each check code.

(How to specify the follower outdoor unit in which error occurred)

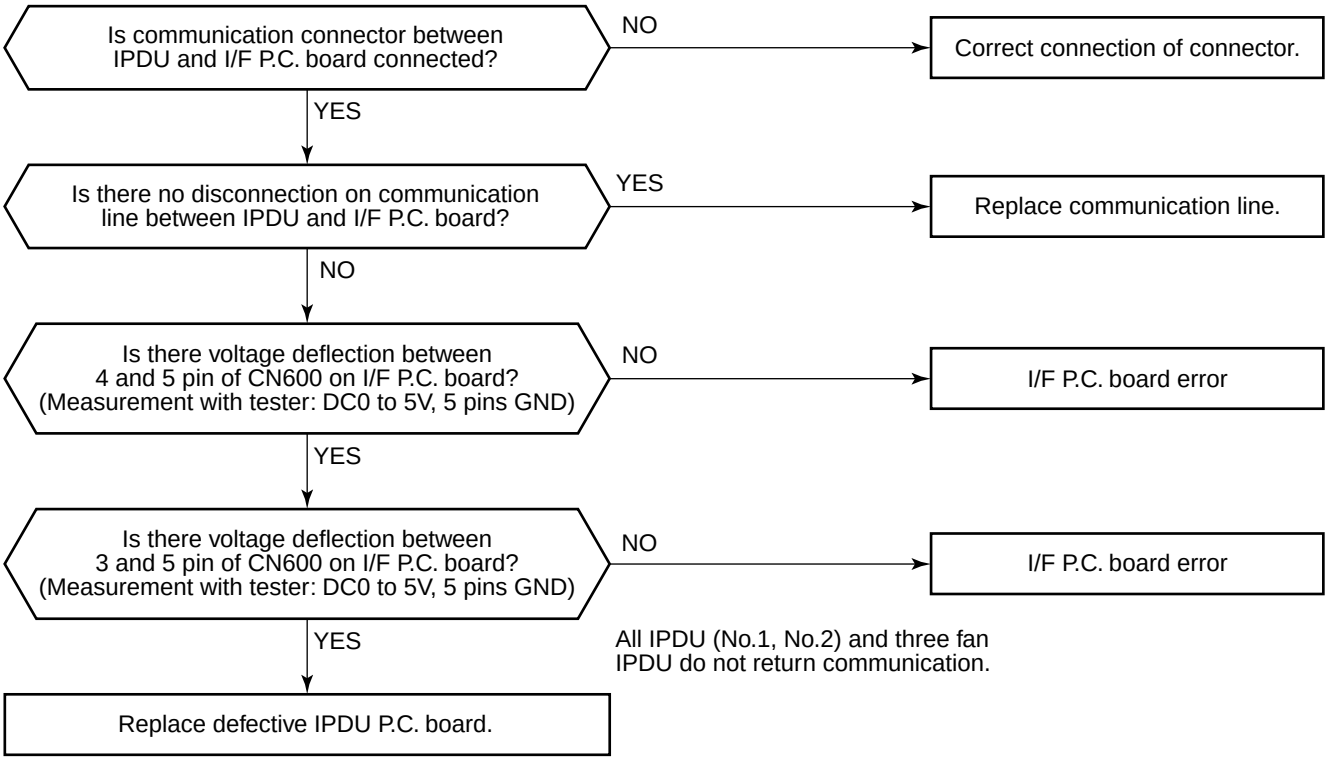
If pushing SW04 for 1 second or more under condition that [E28] is displayed on 7-segment display of the header unit, the fan of the outdoor which stopped due to occurrence of error starts rotating. When pushing SW05 singly, the fan operation is cleared.

Check code	Check code name	Cause of operation
[E31] / [CF] (d07 / AI-NET)	**IPDU communication error**	1. Connection error of communication line between IPDU and I/F P.C. board 2. I/F P.C. board error 3. IPDU P.C. board error 4. External noise

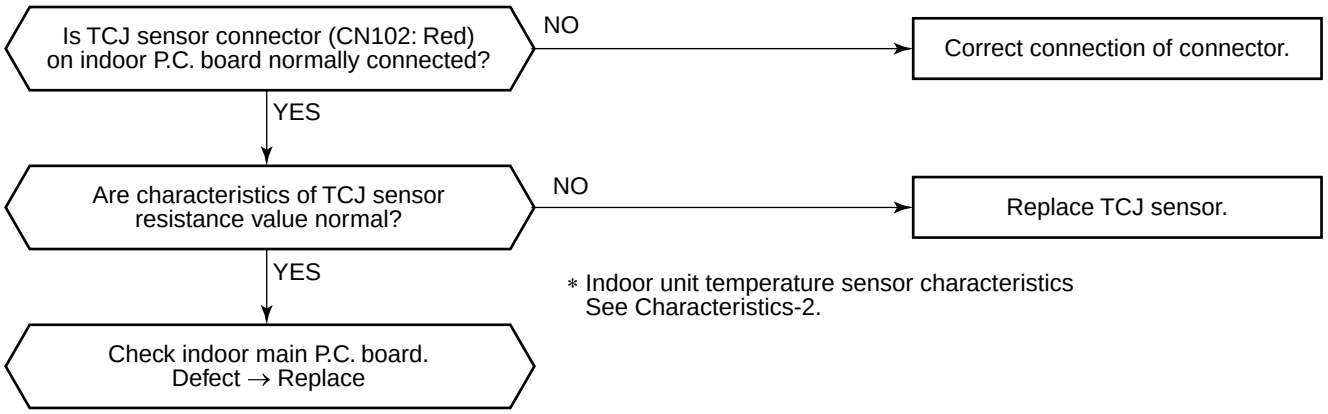
Sub-code:

01: IPDU1 error
02: IPDU2 error
03: IPDU1, 2 error
04: Fan IPDU error
05: IPDU1, fan IPDU error
06: IPDU2, fan IPDU error
07: All IPDU error or communication line error between IPDU-I/F P.C. boards, or outdoor I/F P.C. board error

∗ If the fan IPDU is abnormal, be sure to check the voltage output on the fan power supply P.C. board.

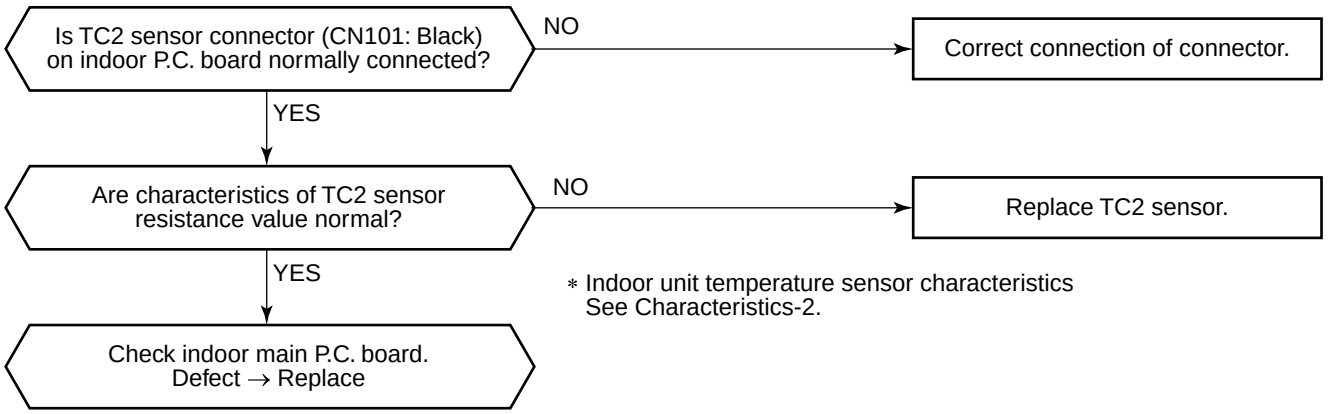


Check code	Check code name	Cause of operation
[F01] / [0F] (d07 / AI-NET)	**Indoor TCJ sensor error**	TCJ sensor Open/Short



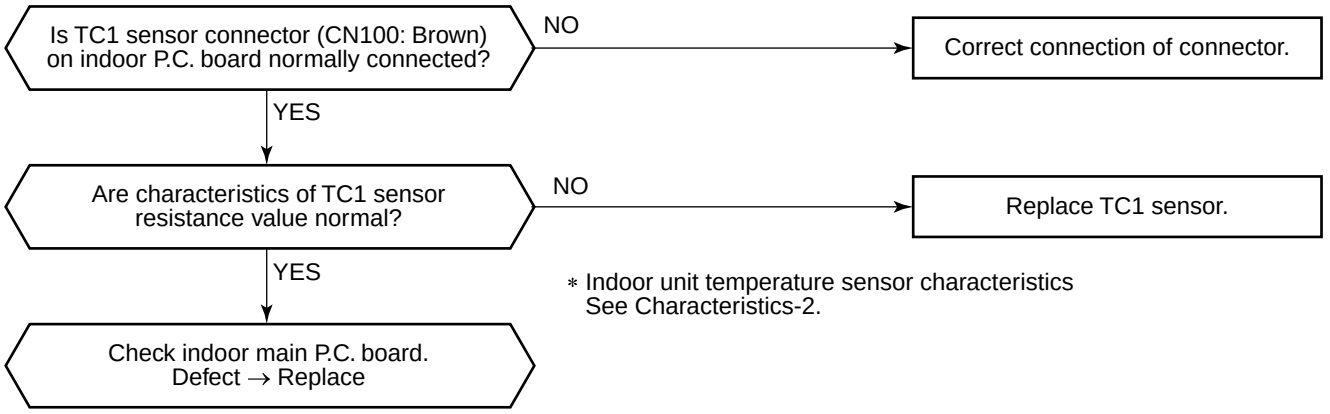
* Indoor unit temperature sensor characteristics
See Characteristics-2.

Check code	Check code name	Cause of operation
[F02] / [0d] (d07 / AI-NET)	**Indoor TC2 sensor error**	TC2 sensor Open/Short



* Indoor unit temperature sensor characteristics
See Characteristics-2.

Check code	Check code name	Cause of operation
[F03] / [93] (d07 / AI-NET)	**Indoor TC1 sensor error**	TC1 sensor Open/Short



∗ Indoor unit temperature sensor characteristics
See Characteristics-2.

Check code	Check code name	Cause of operation
[F04] / [19] (d07 / AI-NET)	**TD1 sensor error**	TD1 sensor Open/Short

This error code means detection of Open/Short of TD1 sensor. Check disconnection of circuit for connection of connector (TD1 sensor: CN502, White) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F05] / [A1] (d07 / AI-NET)	**TD2 sensor error**	TD2 sensor Open/Short

This error code means detection of Open/Short of TD2 sensor. Check disconnection of circuit for connection of connector (TD2 sensor: CN503, Pink) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F06] / [18] (d07 / AI-NET)	**TE1 sensor error**	TE1 sensor Open/Short

This error code means detection of Open/Short of TE1 sensor. Check disconnection of circuit for connection of connector (TE1 sensor: CN505, Green) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F07] / [18] (d07 / AI-NET)	**TL sensor error**	TL sensor Open/Short

This error code means detection of Open/Short of TL sensor. Check disconnection of circuit for connection of connector (TL sensor: CN521, White) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F08] / [1b] (d07 / AI-NET)	**TO sensor error**	TO sensor Open/Short

This error code means detection of Open/Short of TO sensor. Check disconnection of circuit for connection of connector (TO sensor: CN507, Yellow) and characteristics of sensor resistance value.
(Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F10] / [0C] (d07 / AI-NET)	**Indoor TA sensor error**	TA sensor Open/Short

This error code means detection of Open/Short of TA sensor. Check disconnection of circuit for connection of connector (TA sensor: CN104, Yellow) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace indoor P.C. board.

Check code name	Check code name	Cause of operation
[F12] / [A2] (d07 / AI-NET)	**TS1 sensor error**	TS1 sensor Open/Short

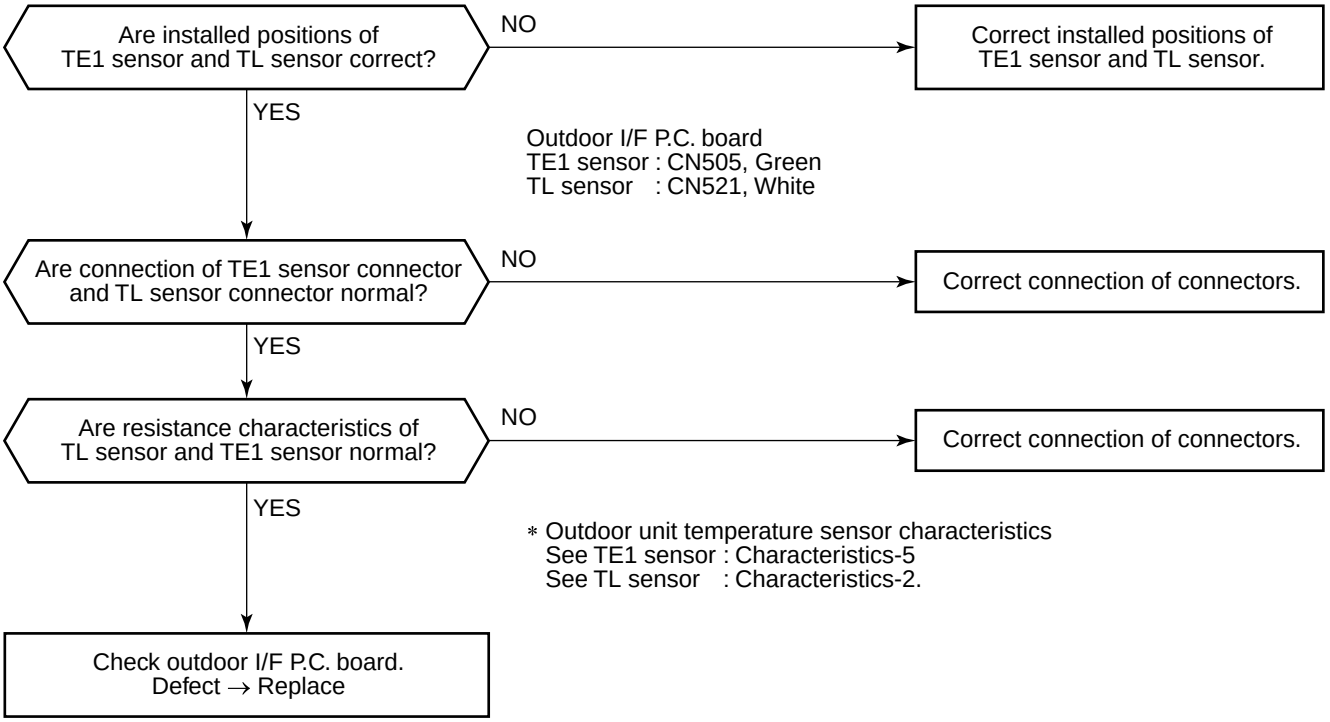
This error code means detection of Open/Short of TS1 sensor. Check disconnection of circuit for connection of connector (TS1 sensor: CN504, White) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F13] / [43] (d07 / AI-NET)	**TH sensor error**	IGBT built-in sensor error in A3-IPDU

Sub-code: 01: Compressor 1 side 02: Compressor 2 side

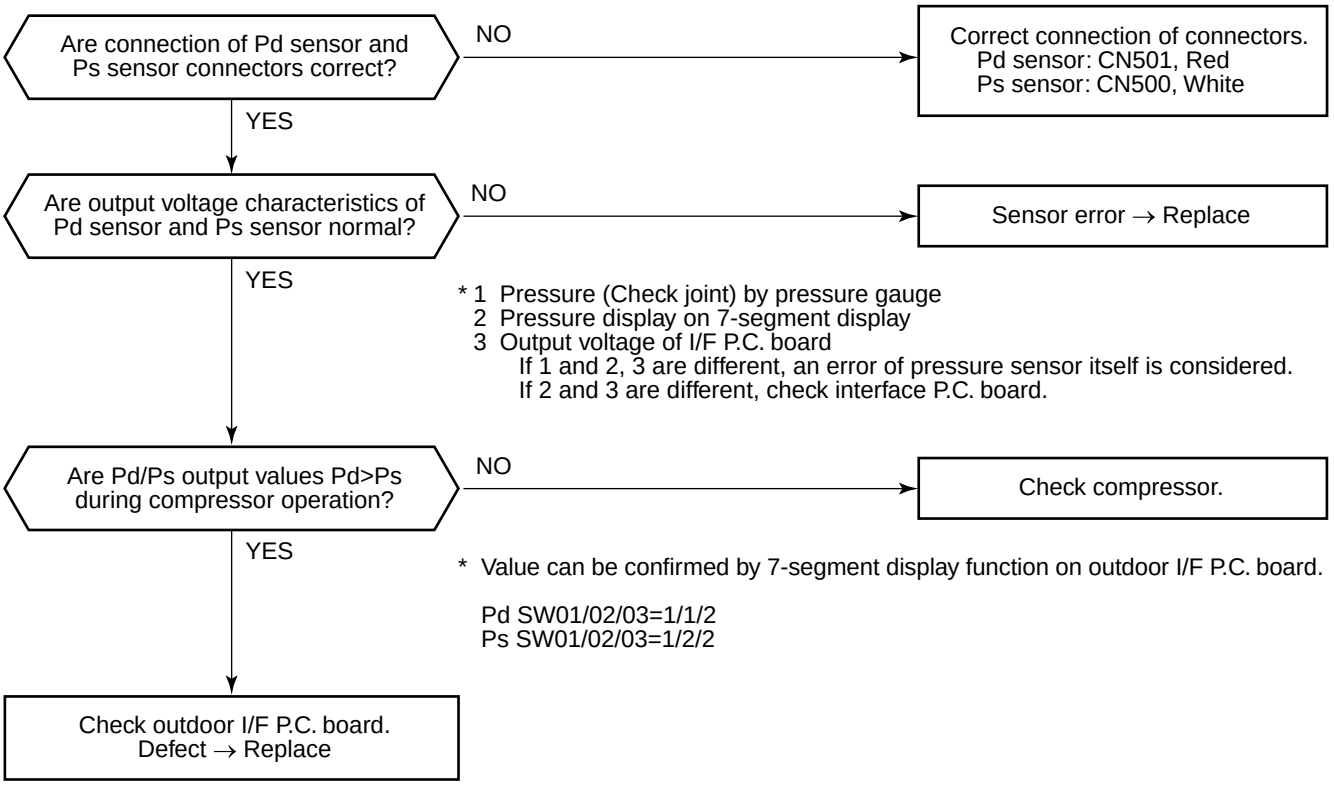
This error code means IGBT built-in temperature sensor error.
Check connection of connectors CN06 on IPDU P.C. board and CN600 on I/F P.C. board.
If sensor is normal, replace IPDU P.C. board.

Check code name	Check code name	Cause of operation
[F15] / [18] (d07 / AI-NET)	**Outdoor temp sensor miscabling (TE1, TL)**	1. Misinstallation and misconnection of TE1 sensor and TL sensor 2. Resistance characteristics error of TE1 sensor and TL sensor 3. Outdoor P.C. board (I/F) error

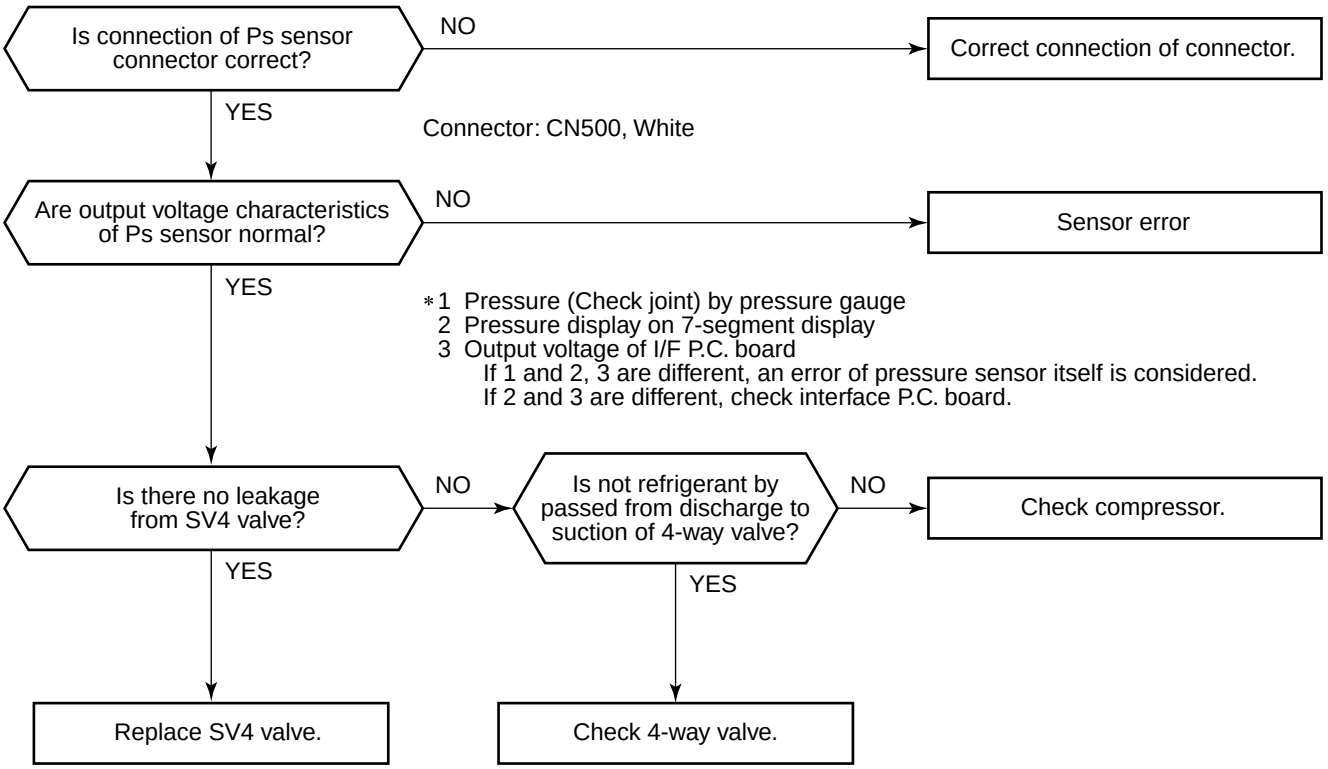


∗ TE1 sensor : Outdoor heat exchanger temp sensor
TL sensor : Temp sensor between liquid tanks of outdoor PMV1/2

Check code name	Check code name	Cause of operation
[F16] / [43] (d07 / AI-NET)	**Outdoor pressure sensor miscabling (Pd, Ps)**	1. High-pressure Pd sensor and low-pressure sensor Ps are exchanged. 2. Output voltage of each sensor is zero.



Check code name	Check code name	Cause of operation
[F23] / [43] (d07 / AI-NET)	**Ps sensor error**	Output voltage error of Ps sensor



Check code name	Check code name	Cause of operation
[F24] / [43] (d07 / AI-NET)	**Pd sensor error**	Output voltage error of Pd sensor

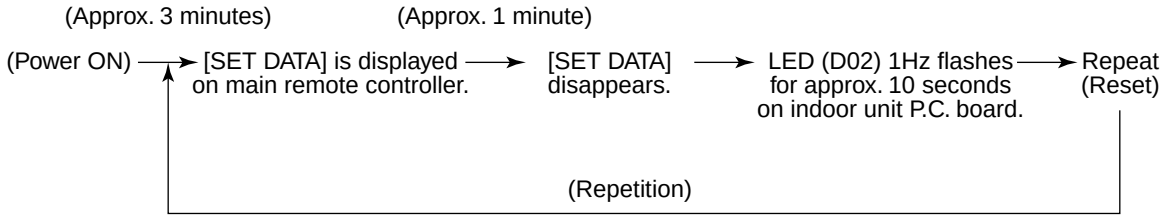
It is output voltage error of Pd sensor. Check disconnection of connection of connector (Pd sensor: CN501) circuit and output voltage of sensor.

If the sensor is normal, replace outdoor I/F P.C. board.

Check code name	Check code name	Cause of operation
[F29] / [12] (d07 / AI-NET)	**Indoor other error**	Indoor P.C. board error EEROM error

This error is detected during operation of air conditioner of IC10 non-volatile memory (EEPROM) on indoor unit P.C. board. Replace service P.C. board.

∗ If EEPROM was not inserted when power was turned on or it is absolutely impossible to read/write EEPROM data, the automatic address mode is repeated. In this case, [97 error] is displayed on AI-NET central controller.

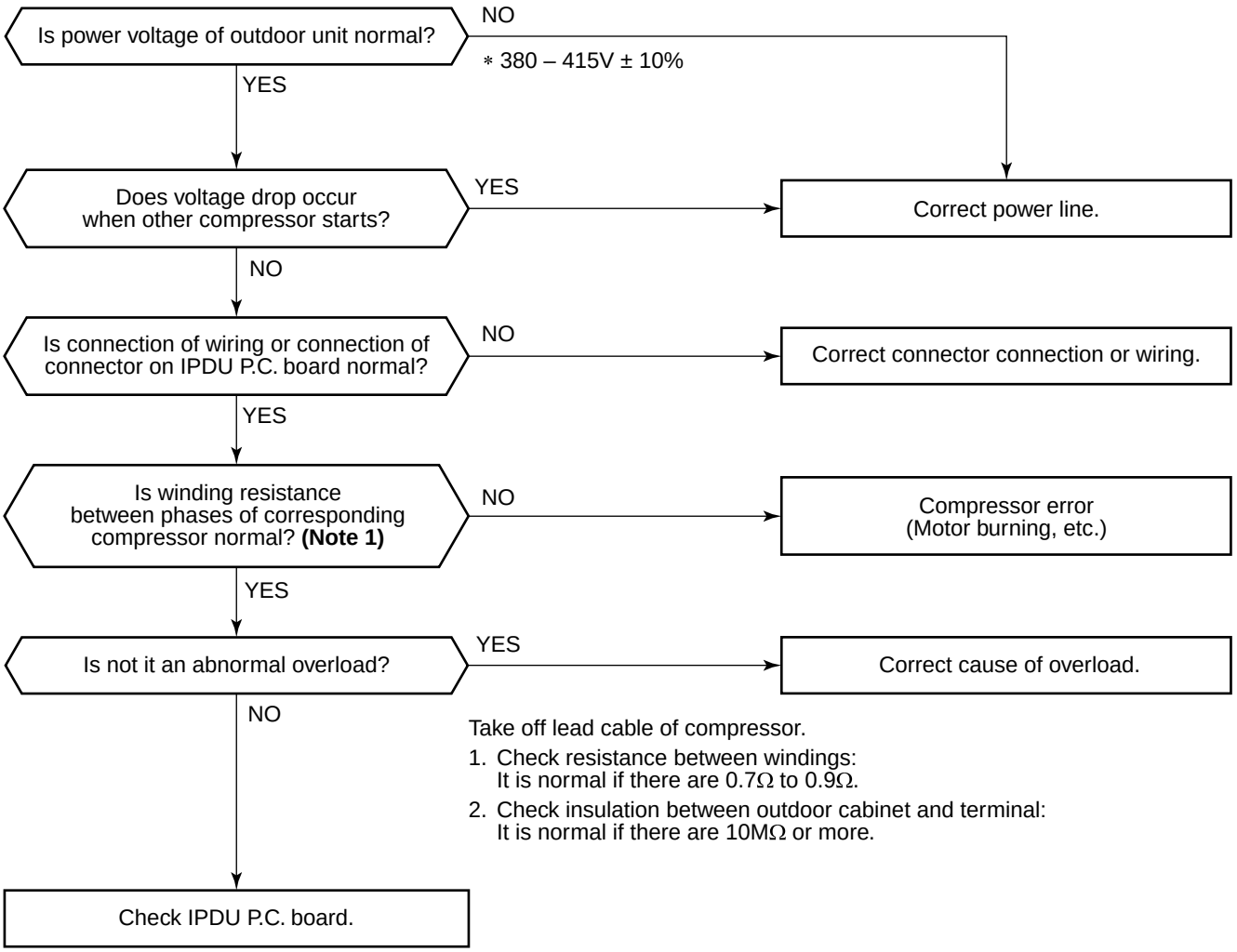


Check code name	Check code name	Cause of operation
[F31] / [1C] (d07 / AI-NET)	**Outdoor EEPROM error**	1. Outdoor unit power error (Voltage, noise, etc.) 2. Outdoor I/F P.C. board error



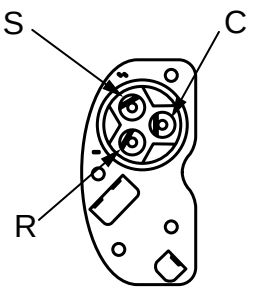
Check code name	Check code name	Cause of operation
[H01] / [1F] (d07 / AI-NET)	**Compressor breakdown**	1. Outdoor unit power line error 2. Compressor circuit system error 3. Compressor error 4. Cause of abnormal overload operation 5. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Note 1

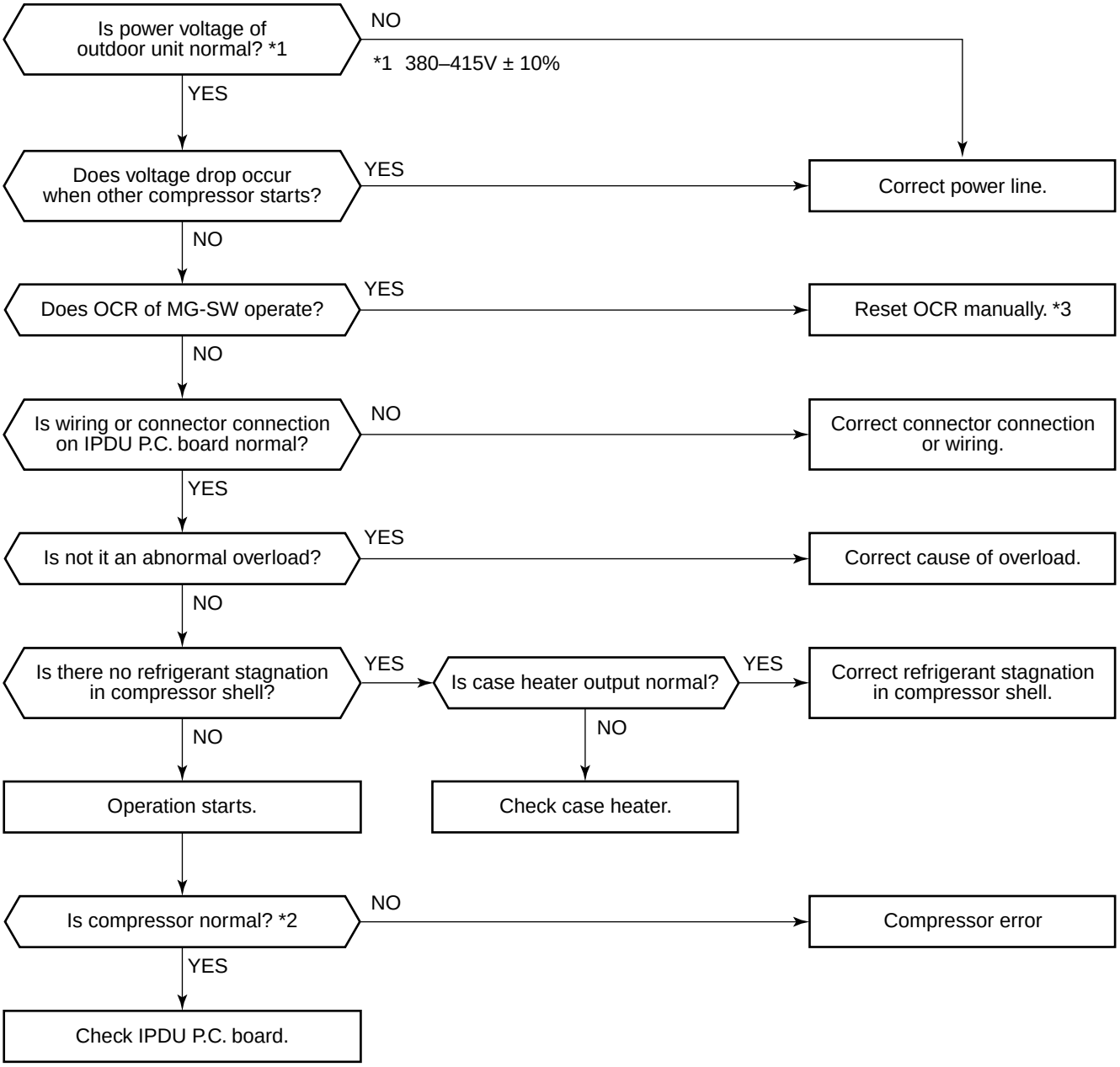
∗ After checking the output, when connecting the compressor lead again to the compressor terminal, check surely there is no distortion on the Fasten receptacle terminal.
If it is loosened, caulk it with pinchers, etc and then connect lead to the terminal firmly.



Details of compressor power connecting section

Check code name	Check code name	Cause of operation
[H02] / [1d] (d07 / AI-NET)	**Compressor error (Lock)**	1. Outdoor unit power line error 2. Compressor circuit system error 3. Compressor error 4. Refrigerant stagnation in compressor shell 5. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



*2 Check the following items mainly.
1. Existence of abnormal sound and abnormal vibration during operation or starting
2. Abnormal overheat of case during operation or stop time (Never touch with hands.)
3. Current of compressor lead during operation or starting time
(No varied change of current) change

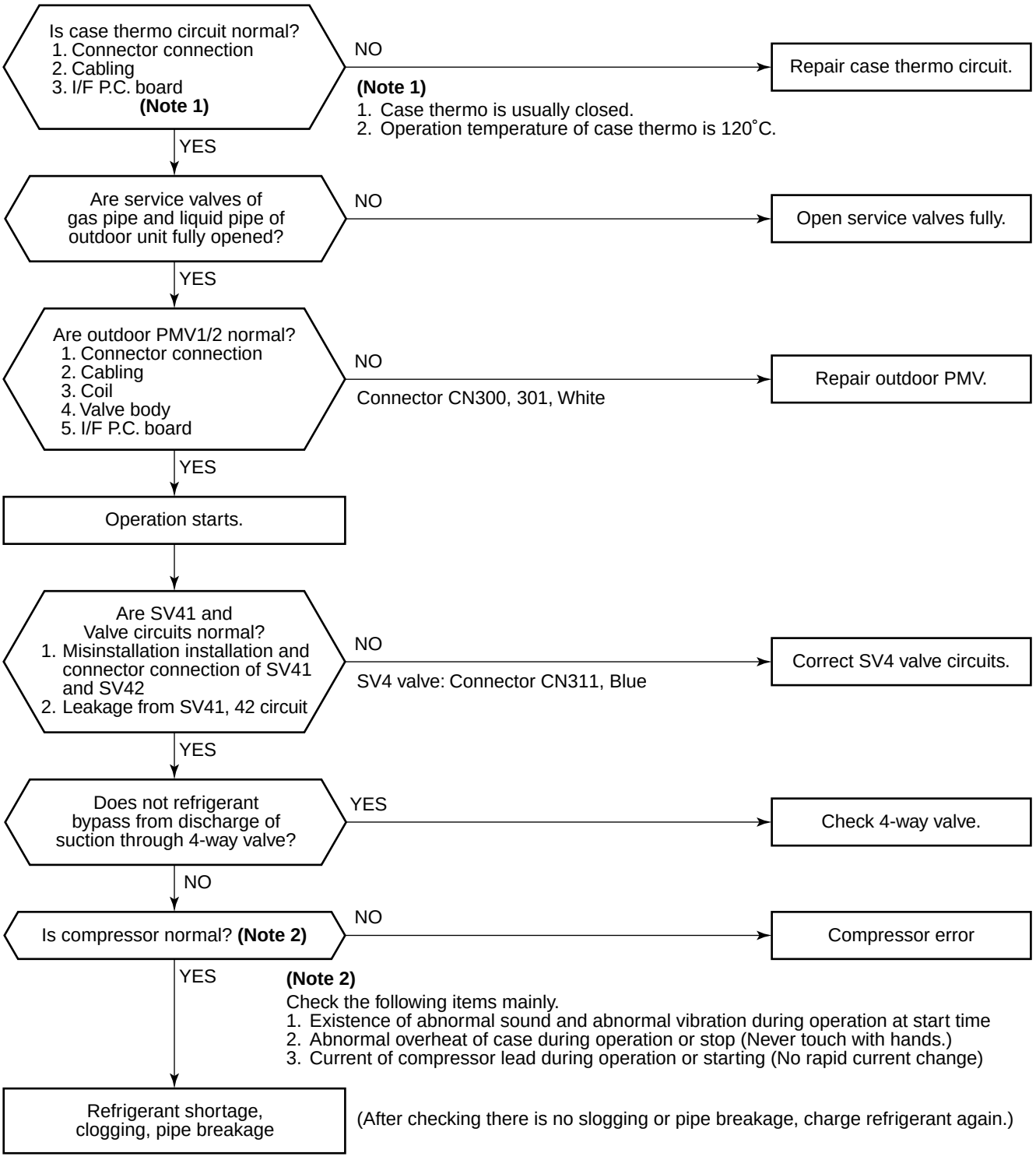
*3 If OCR operates even after manual reset of OCR, check whether the wiring to the current sensor (TO2) of Comp-IPDU is correct or not.

Check code name	Check code name	Cause of operation
[H03] / [17] (d07 / AI-NET)	**Current detective circuit system error**	1. Cabling or connector connection error on IPDU P.C. board 2. IPDU P.C. board error

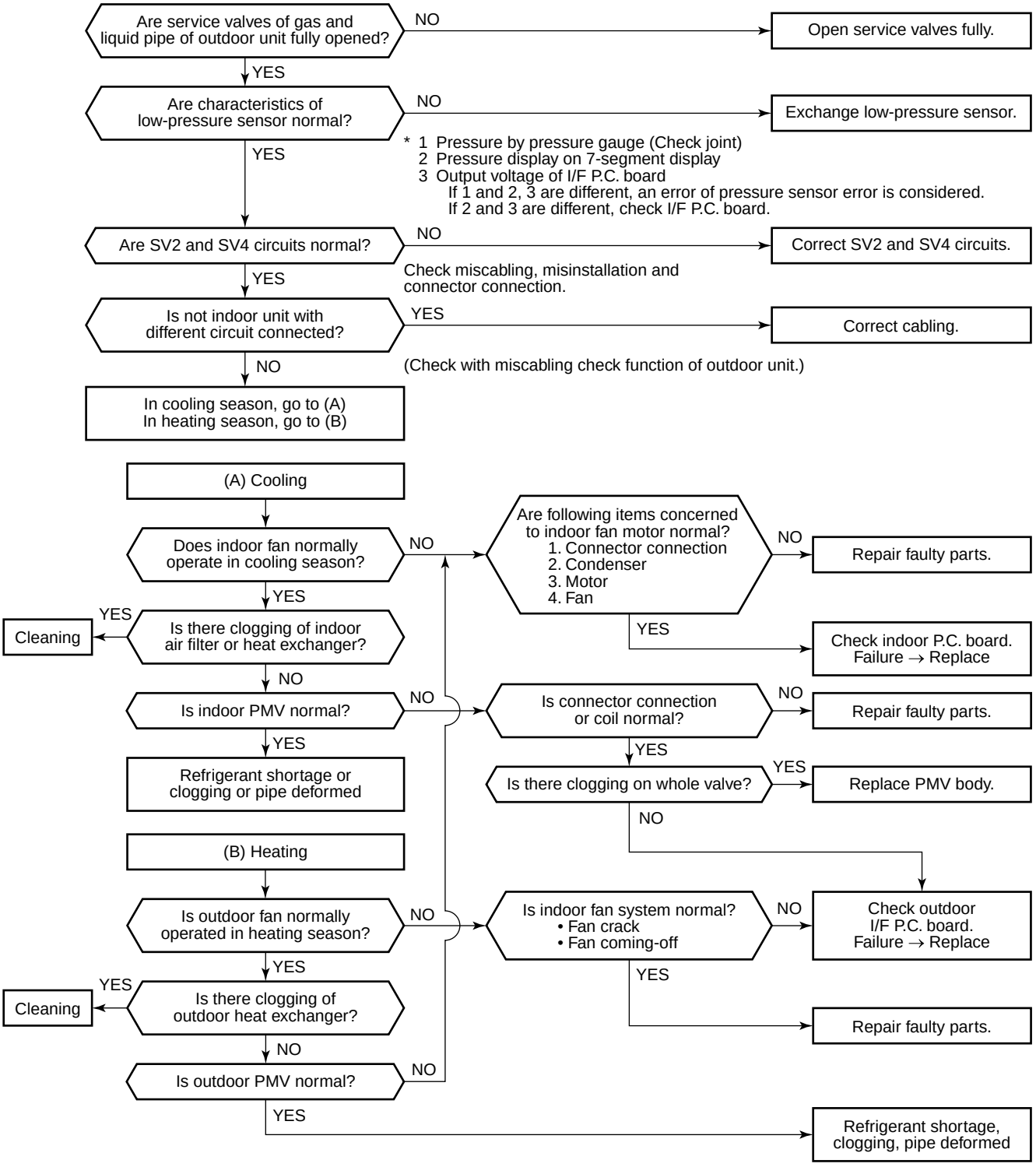
Sub-code: 01: Compressor 1 side 02: Compressor 2 side



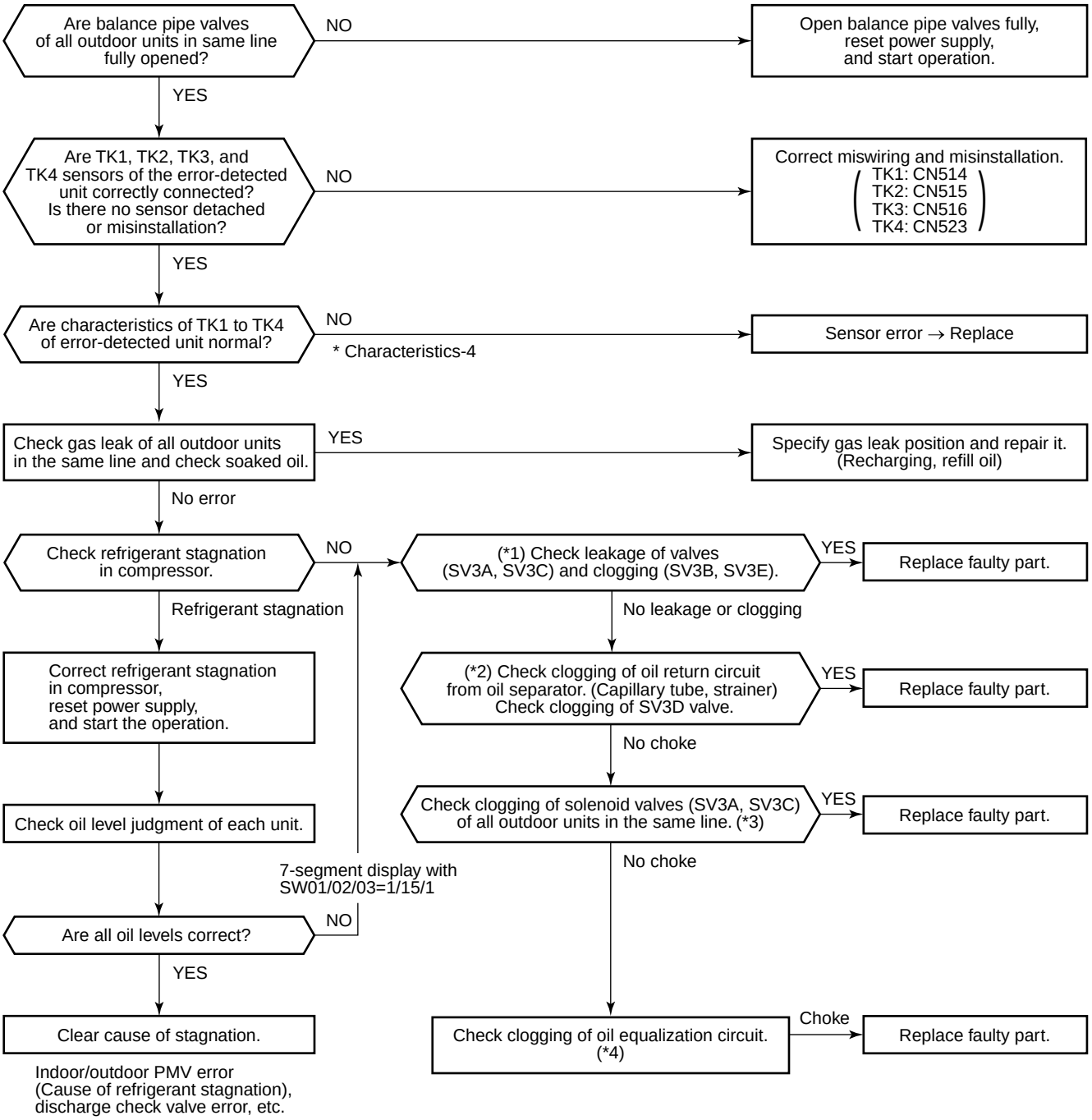
Check code name	Check code name	Cause of operation
[H04] / [44] (d07 / AI-NET) **[H14] / [44]** (d07 / AI-NET)	**Compressor 1 case thermo operation** **Compressor 2 case thermo operation**	1. Case thermo circuit error 2. I/F P.C. board error 3. Service valve closed 4. Outdoor PMV clogging 5. SV4 valve leak, Coil misinstallation 6. 4-way valve error 7. Compressor error 8. Refrigerant shortage



Check code name	Check code name	Cause of operation
[H06] / [20] (d07 / AI-NET)	**Low-pressure protective operation**	1. Service valve close 2. Ps sensor error 3. SV2, SV4 circuit error 4. Miscabling of communication between indoor and outdoor 5. Indoor/outdoor fan and condenser error 6. Indoor/outdoor PMV clogging 7. Indoor/outdoor heat exchanger clogging 8. Refrigerant shortage



Check code name	Check code name	Cause of operation
[H07] / [d7] (d07 / AI-NET)	**Oil level down detection protection**	1. Valves of balance pipes closed. 2. Miscabling or misinstallation of TK1 to TK4 sensors 3. TK1 to TK4 sensor error 4. Gas leak or oil leak of all outdoor units 5. Refrigerant stagnation of compressor case 6. SV3A, 3B, 3D, 3C, 3E valve error 7. Clogging of oil return circuit from oil separator 8. Clogging of oil-equation circuit system



(Reference) When refrigerant stagnates in compressor shell, the oil level shortage may be judged.

In some cases, it may be difficult to check the leakage of clogging in the following condition of refrigerant stagnation in low ambient temperature condition.
In this case, take a longer operating time prior to check.
(Criterion: Discharge temperature of TD1 and TD2 are 60°C or higher)

(*1)

a) Leakage check for SV3A valve (For multiple outdoor unit system)

- Turn off the power supply, take off connector of SV3A valve, and then start a test operation after power-ON.
- Check the temperature change at secondary side of SV3A valve during operation . (① in the figure.)
  → If temperature is raised, it is a leakage of SV3A valve. Replace SV3A valve.

b) Leakage check for SV3C valve

- Turn off the power supply, take off connector of SV3C valve, and then start a test operation after power-ON.
- After operation for several minutes, check temperature at secondary side of SV3C valve. (② in the figure.)
  → If temperature is high (equivalent to discharge temperature TD), it is a leakage of SV3C valve. Replace SV3C valve.
  (Even if there is leakage from SV3C valve does not occur, temperature of SV3C valve at secondary side rises during operation. When the checked temperature is equivalent to TD temperature, it is a leakage of SV3C valve. Replace SV3C valve.)

c) Clogging check for SV3B valve (For multiple outdoor unit system)

- While outdoor unit is operated, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr] [2], and push SW04 for 2 seconds or more.
- Set up SW02 = [9], and turn on SV3A, SV3B, SV3C valves. (7-segment display [Hr] [3–])
- While outdoor unit is operating, check temperature change at secondary side of SV3B valve. (③ in the figure.)
  → If temperature does not rise (equivalent to suction temperature), it is a clogging of SV3B valve.
  Replace SV3B valve.

d) Clogging for SV3E valve

Reset the power supply.

⇩

Referring to “Valve forced open/close function” of the outdoor unit, check ON/OFF operation (Sound, coil surface temp up) of SV3E valve is performed.

⇩

Start test operation in COOL or HEAT mode.

⇩

After operation for several minutes, check the pipe temperature at the secondary side of SV3E valve whether temperature changes or not. If it is equivalent to outside temperature, clogging of SV3E is considered.
(④ in the figure.)

(Reference)

If SV3E valve is clogged, temperature of all TK1, TK2, TK3, and TK4 do not change.

(*2) Clogging check for SV3D valve of oil return circuit from oil separator

a) Oil return circuit

- While outdoor unit is operating, check temperature (secondary side of capillary) on oil return circuit.
  (⑤ in the figure.)
  → If temperature is low equivalent to suction temperature), a clogging of strainer of oil return circuit or capillary is considered. Repair the clogged part.

b) Clogging check for SV3D valve

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr] [2], and push SW04 for 2 seconds or more.
- Set up SW02 = [6], and turn on SV3D valve. (7-segment display [Hr] [3d])
- If temperature is low at secondary side of the valve or it does not change, clogging of valve, capillary, or strainer is considered. (⑥ in the figure.)

(*3) Check for solenoid valve of outdoor unit (For multiple outdoor unit system)

a) Clogging check for SV3A valve

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr] [2], and push SW04 for 2 seconds or more.
- Set up SW02 = [4], and turn on SV3A valve. (7-segment display [Hr] [3A])
- If temperature is low at secondary side of the valve or it does not change, clogging of valve or check valve is considered. (① in the figure.)

b) Leakage check for SV3C valve

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr] [2], and push SW04 for 2 seconds or more.
- Set up SW02 = [6], and turn on SV3C valve. (7-segment display [Hr] [3C])
- If temperature does not change (up), clogging of valve or strainer is considered. (② in the figure.)

(*4)

a) Clogging check for oil-equalization circuit

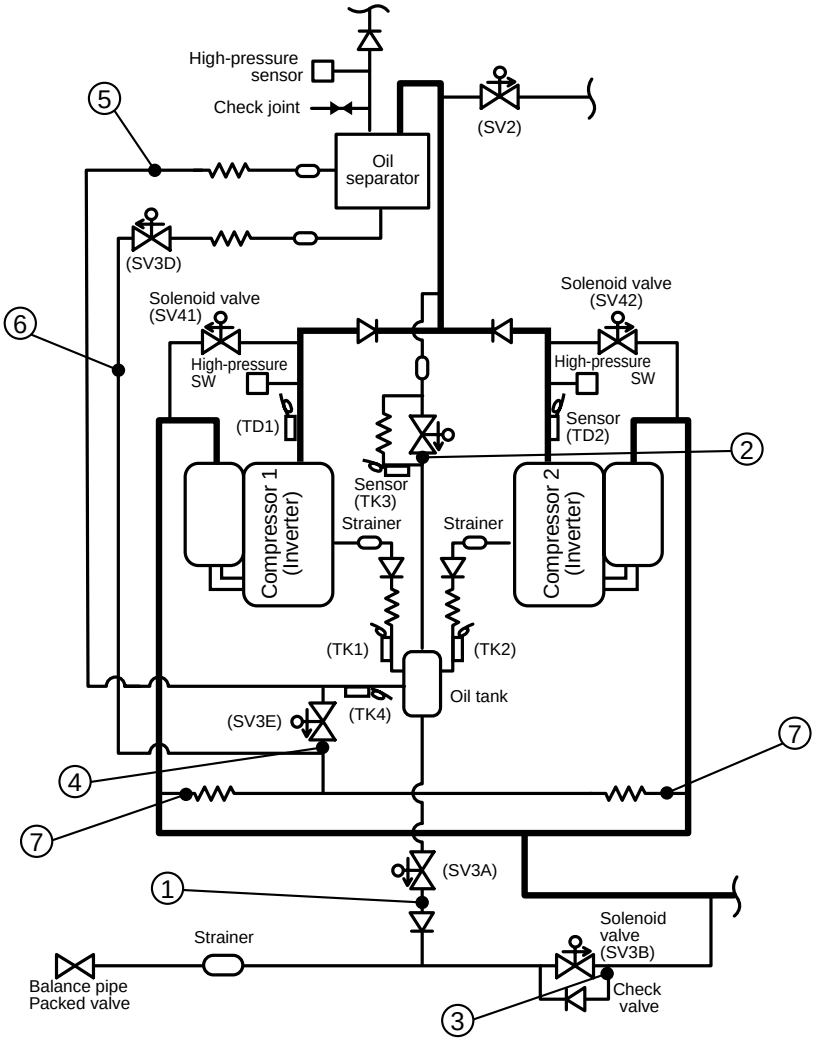
- Drive the outdoor unit. (Drive both compressors in the unit.)
- After driving for 10 minutes, check temperature of TK1 and TK2 sensors and temperature of oil-equalization circuit capillary (⑦ in the figure) were raised.

(Criterion)

TK1, TK2=Td1, Td2 temperature – Approx. 10 to 30°C

Oil-equalization capillary tubes should be higher sufficiently than outside air temperature and suction temperature.

- If temperature is low, a malfunction of capillary, strainer, or check valve is considered.
  Repair the defective parts.



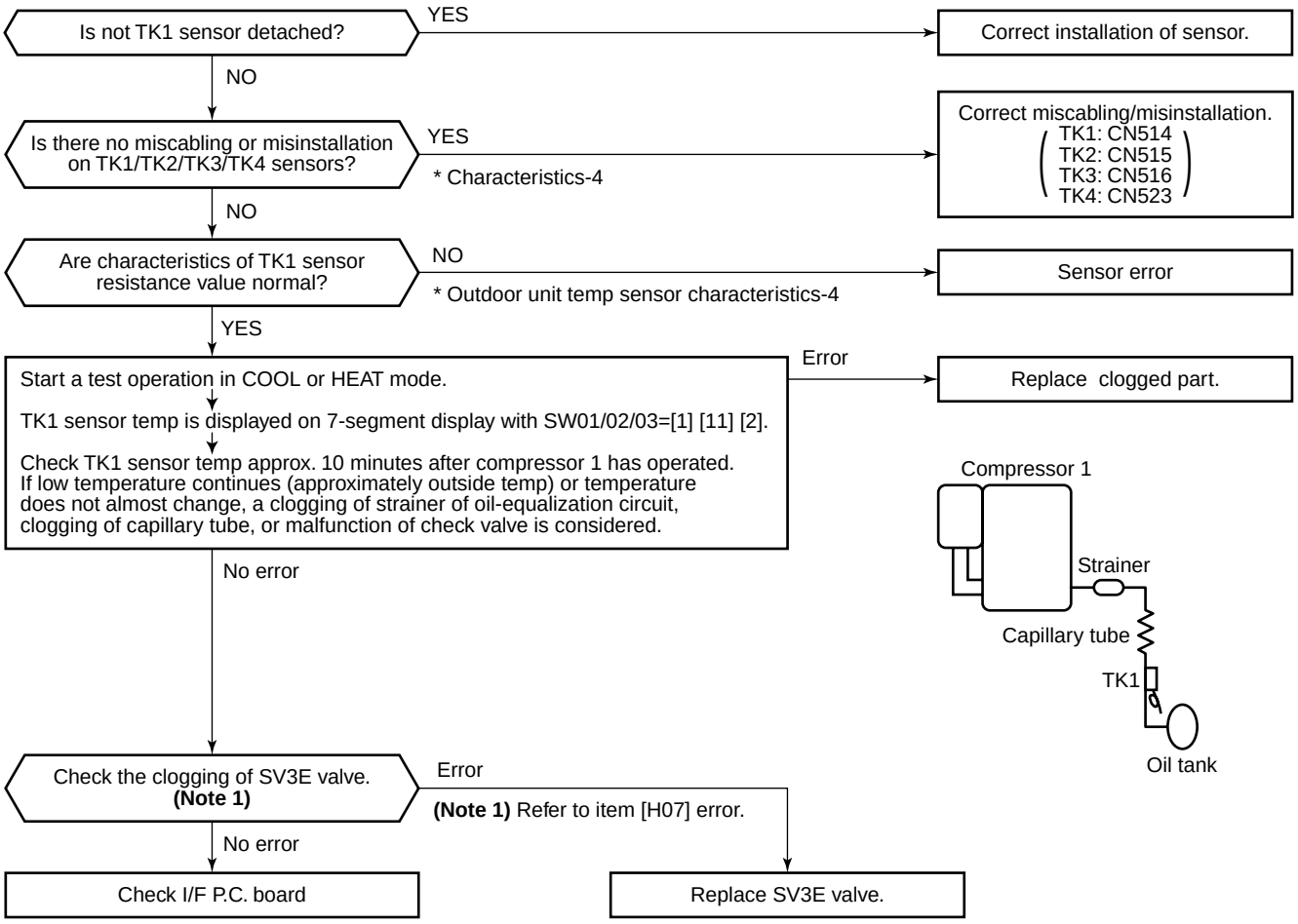
Check code name	Check code name	Cause of operation
[H08] / [d4] (d07 / AI-NET)	**Oil level detective temperature sensor error**	TK1 to TK4 sensor Open/Short

Sub-code: 01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error

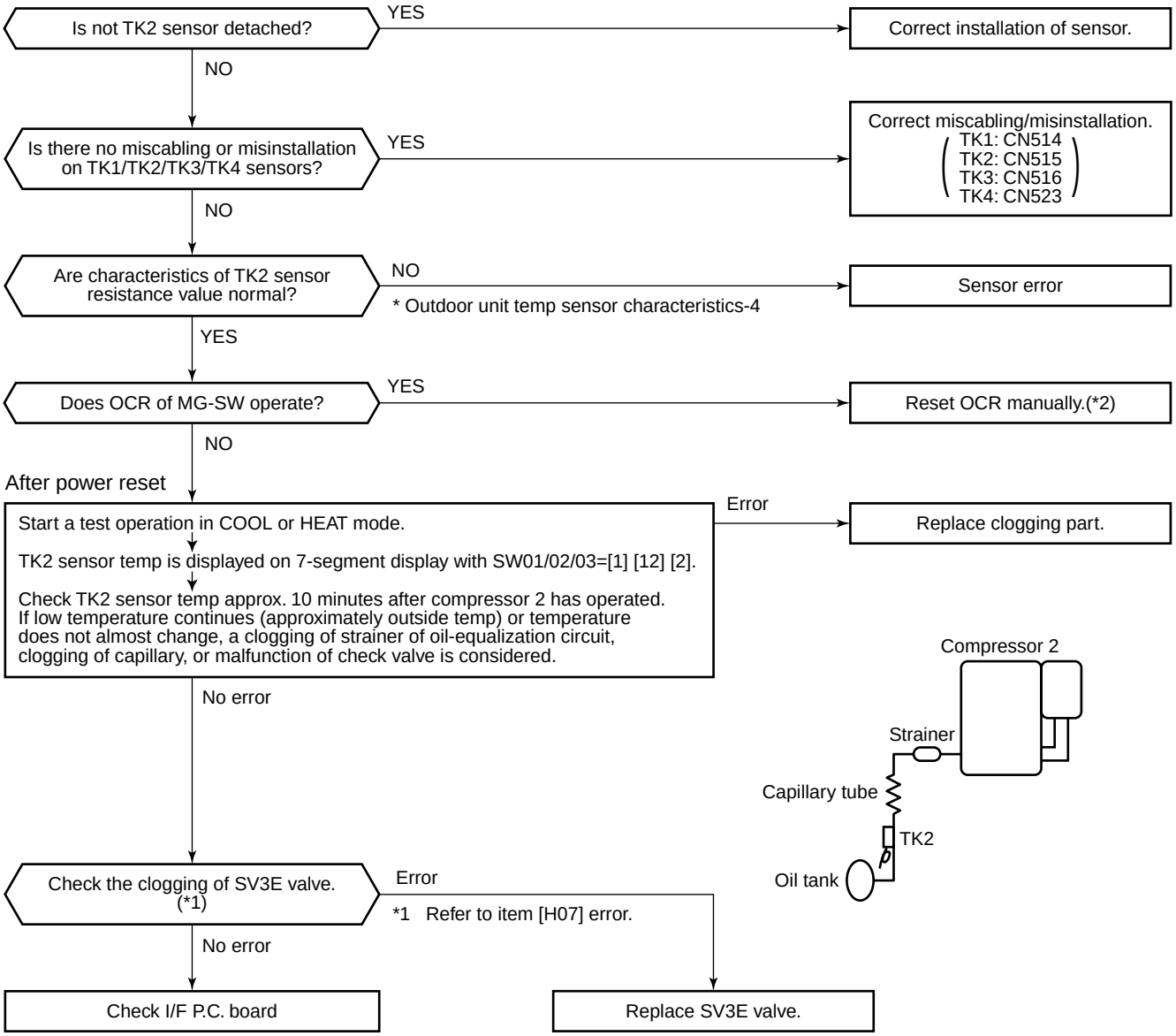
The detected error is an oil level detective temperature sensor error.
Check disconnection of the wiring and resistance value of the sensor.
If the sensors are normal, replace the outdoor I/F P.C. board.

Circuit	Connector
TK1	CN514 (Black)
TK2	CN515 (Green)
TK3	CN516 (Red)
TK4	CN523 (Yellow)

Check code name	Check code name	Cause of operation
[H16] / [d7] (d07 / AI-NET)	**TK1 temperature detective circuit error (Sub-code: 01)**	1. Coming-off of TK1 sensor, miscabling, characteristics error of resistance value 2. Oil-equalization circuit error (Check valve, capillary clogging, strainer clogging) 3. Refrigerant stagnation in case of compressor shell

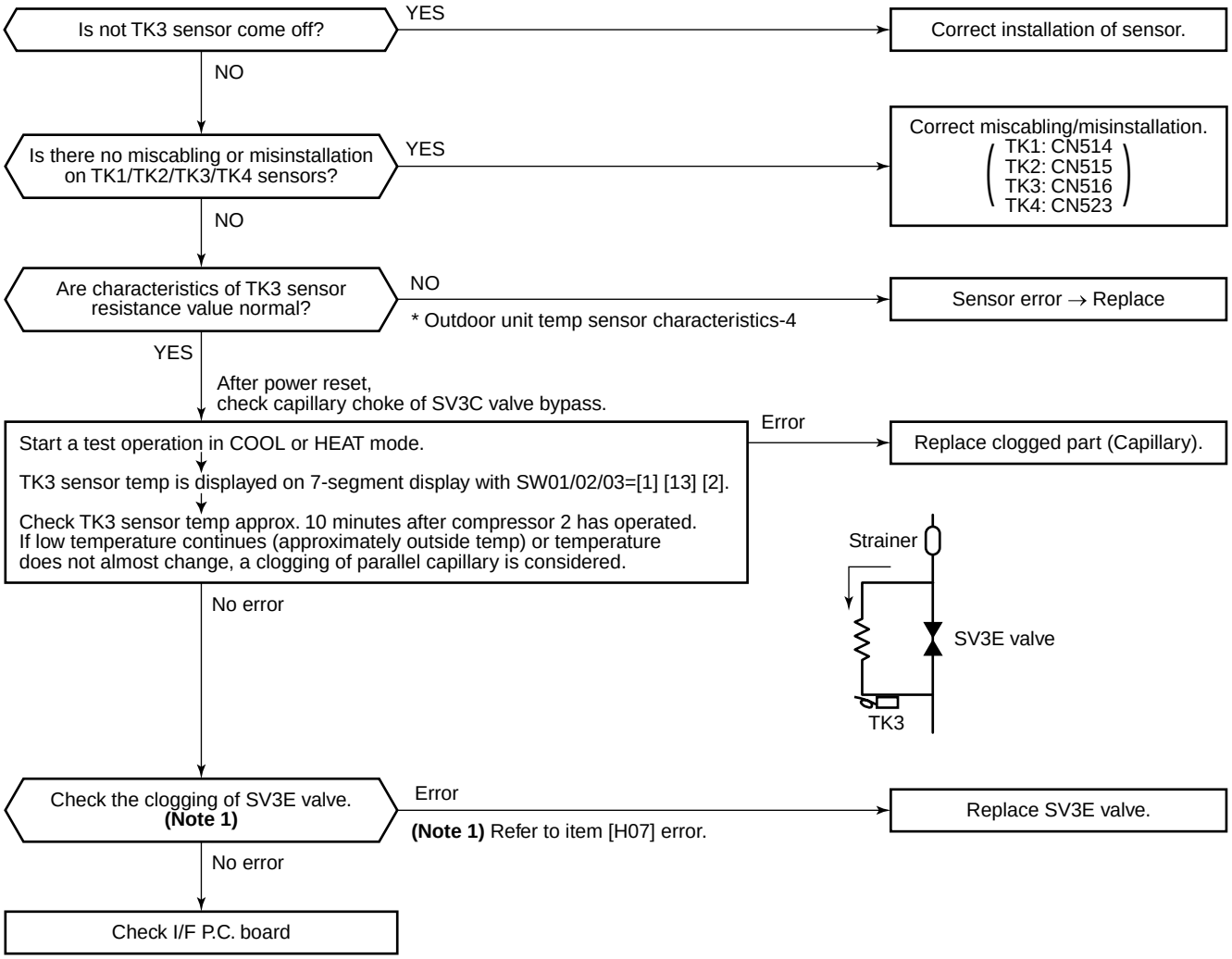


Check code name	Check code name	Cause of operation
[H16] / [d7] (d07 / AI-NET)	**Oil level detective circuit system error (Sub-code: 02)**	1. Detachment of TK2 sensor, miscabling, characteristics error of resistance value 2. Oil-equalization circuit error (Check valve, capillary clogging, strainer clogging) 3. Refrigerant stagnation in compressor shell

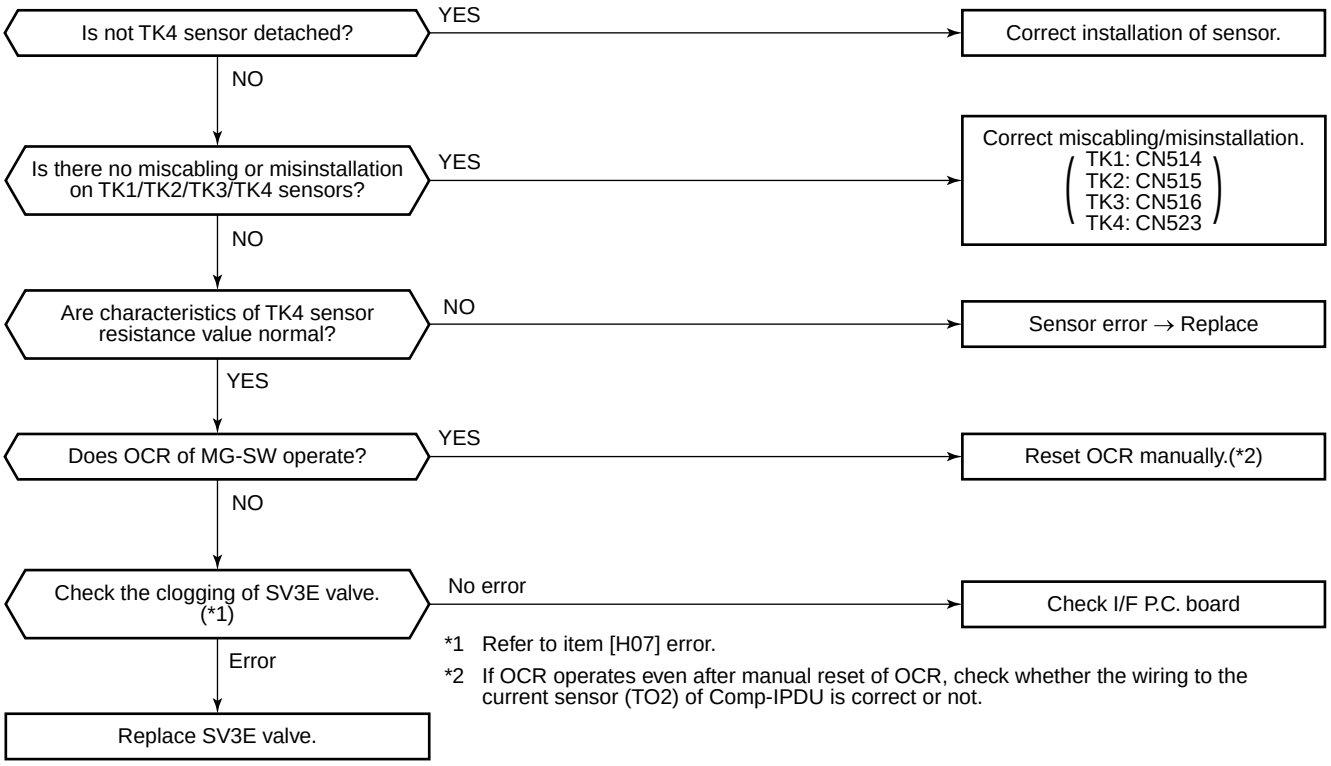


*2 If OCR operates even after manual reset of OCR, check whether the wiring to the current sensor (TO2) of Comp-IPDU is correct or not.

Check code name	Check code name	Cause of operation
[H16] / [d7] (d07 / AI-NET)	**TK3 temperature detective circuit error (Sub-code: 03)**	1. Detachment of TK3 sensor, miscabling, characteristics error of resistance value 2. Error of SV3C valve circuit periphery (Check capillary clogging, strainer clogging) 3. Refrigerant stagnation in compressor shell



Check code name	Check code name	Cause of operation
[H16] / [d7] (d07 / AI-NET)	**TK4 temperature detective circuit error (Sub-code: 04)**	1. Detachment of TK4 sensor, miscabling, characteristics error of resistance value 2. Check clogging and malfunction of SV3E valve circuit. 3. Oil-equalization circuit error (Check capillary clogging, strainer clogging) 4. Refrigerant stagnation in compressor shell



*1 Refer to item [H07] error.

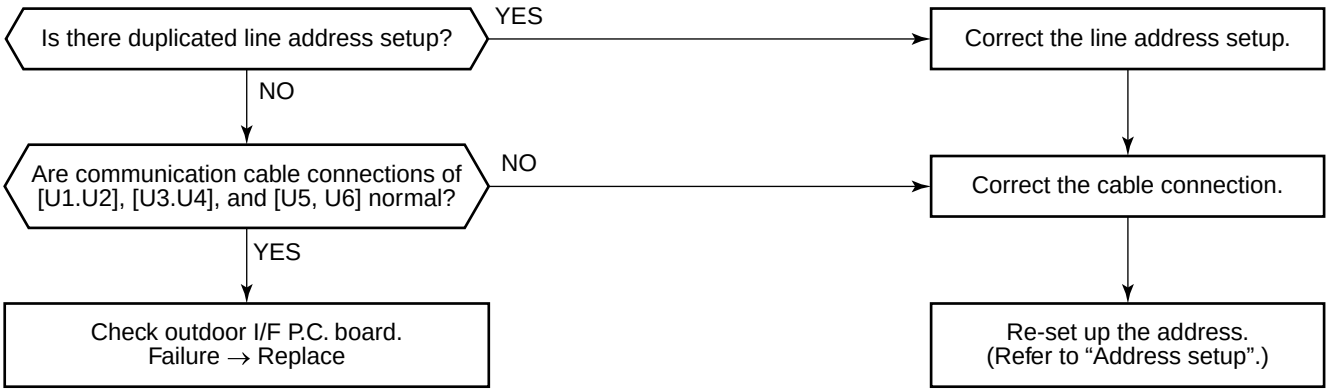
*2 If OCR operates even after manual reset of OCR, check whether the wiring to the current sensor (TO2) of Comp-IPDU is correct or not.

Check the clogging of SV3E valve.

Check code name	Check code name	Cause of operation
[L03] / [96] (d07 / AI-NET)	**Duplicated indoor header units**	There were two or more indoor header units in some remote controller group control.

1) Check the connection changing of the remote controller after the connection has been changed.
2) If the group configuration and address are normal when power has been turned on, the mode automatically shifts to address setup mode. (Re-setup of address) → Refer to “Address setup”.

Check code name	Check code name	Cause of operation
[L04] / [96] (d07 / AI-NET)	**Duplicated setup of outdoor line address**	Outdoor line addresses are duplicated.



Check code name	Check code name	Cause of operation
[L05] / [96] (d07 / AI-NET)	**Duplicated indoor units with priority (Displayed on indoor unit with priority)**	1. Two or more prior indoor units exist.

This check code is displayed on the set indoor unit when setup of indoor unit with priority is duplicated.
• Priority setup with two or more units is not available. Choose one prior unit in one refrigerant circuit system.

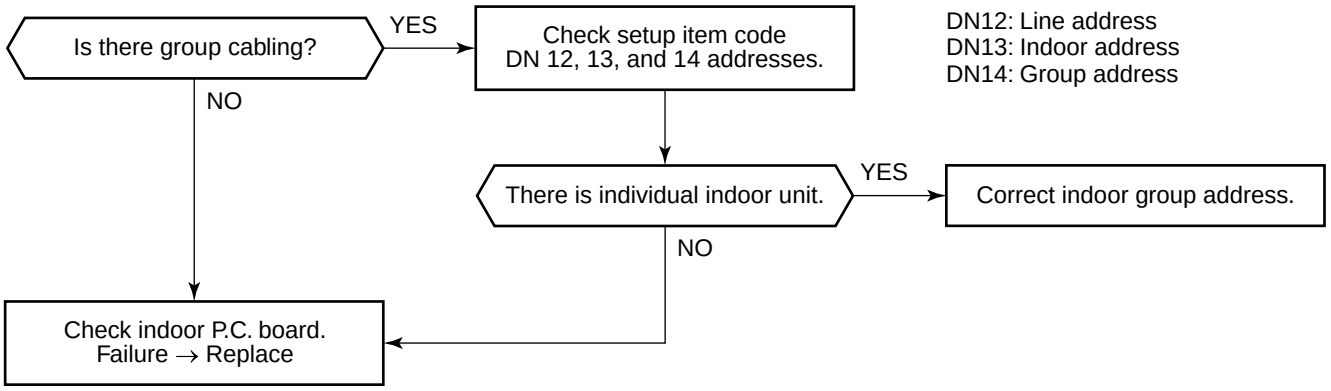
Check code name	Check code name	Cause of operation
[L06] / [96] (d07 / AI-NET)	**Duplicated indoor units with priority (Displayed on the indoor unit other than one with priority and on the outdoor unit)**	Two or more indoor units with priority are duplicated.

Sub-code: No. of indoor units with priority

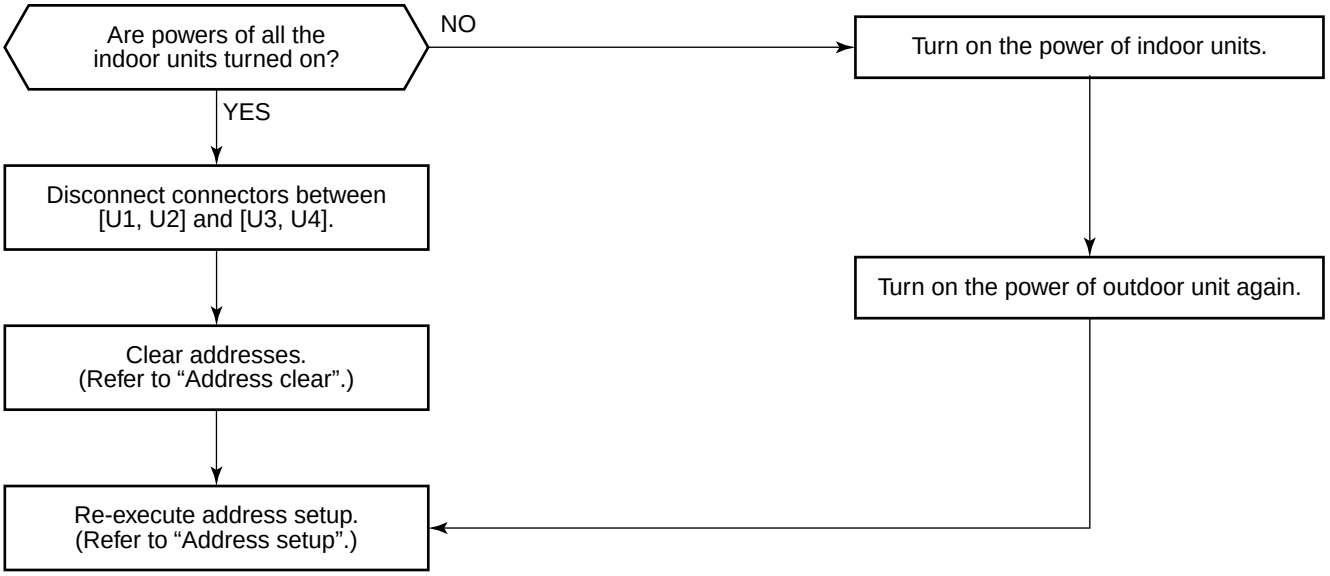
When indoor unit with priority is duplicated, this check code is displayed on the unit other than the setup indoor unit and outdoor unit.

- As only one indoor unit with priority is valid, change the setup.

Check code name	Check code name	Cause of operation
[L07] / [99] (d07 / AI-NET)	**Group line in individual indoor unit**	The group line is connected in the individual indoor unit.

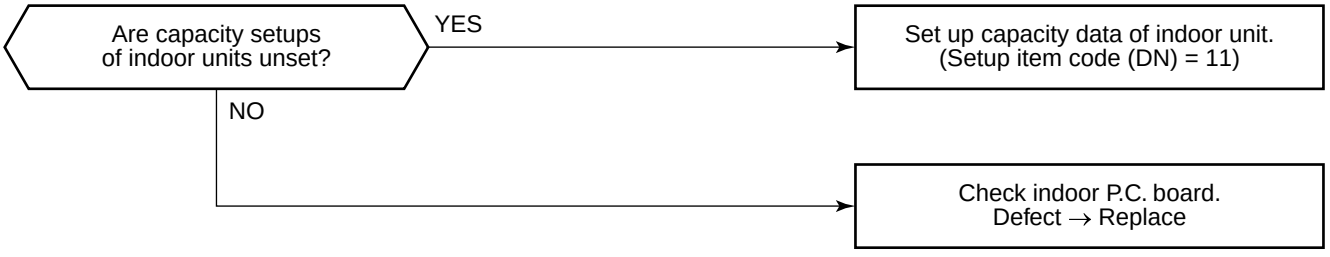


Check code name	Check code name	Cause of operation
[L08] / [99]* (d07 / AI-NET)	**Indoor group / address unset**	Indoor address unset



Note) This code is displayed when the power is turned on at the first time after installation. (Because the address is not yet set up)

Check code name	Check code name	Cause of operation
[L09] / [46] (d07 / AI-NET)	**Indoor capacity unset**	Indoor capacity unset



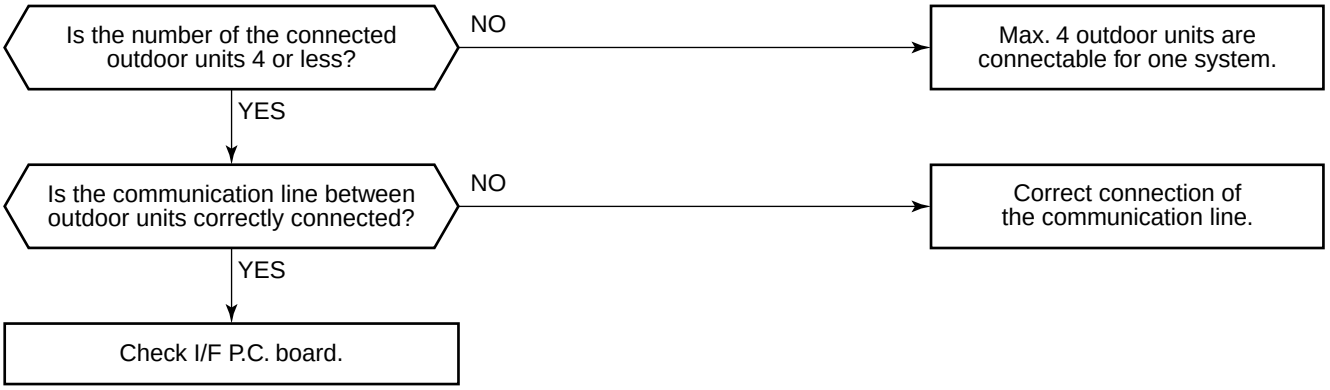
Check code name	Check code name	Cause of operation
[L10] / [88] (d07 / AI-NET)	**Outdoor capacity unset**	On the outdoor IF P.C. board for service, the model selecting jumper has not been set up so as to match with the model.

I/F P.C. board A'ssy service for the outdoor unit is common to this series. A setup for model selection different from that for P.C. board with trouble is necessary. Set up a model based upon the P.C. board A'ssy exchange procedure.

Check code name	Check code name	Cause of operation
[L20] / [98] (d07 / AI-NET)	**Duplicated central control addresses**	Central control addresses are duplicated.

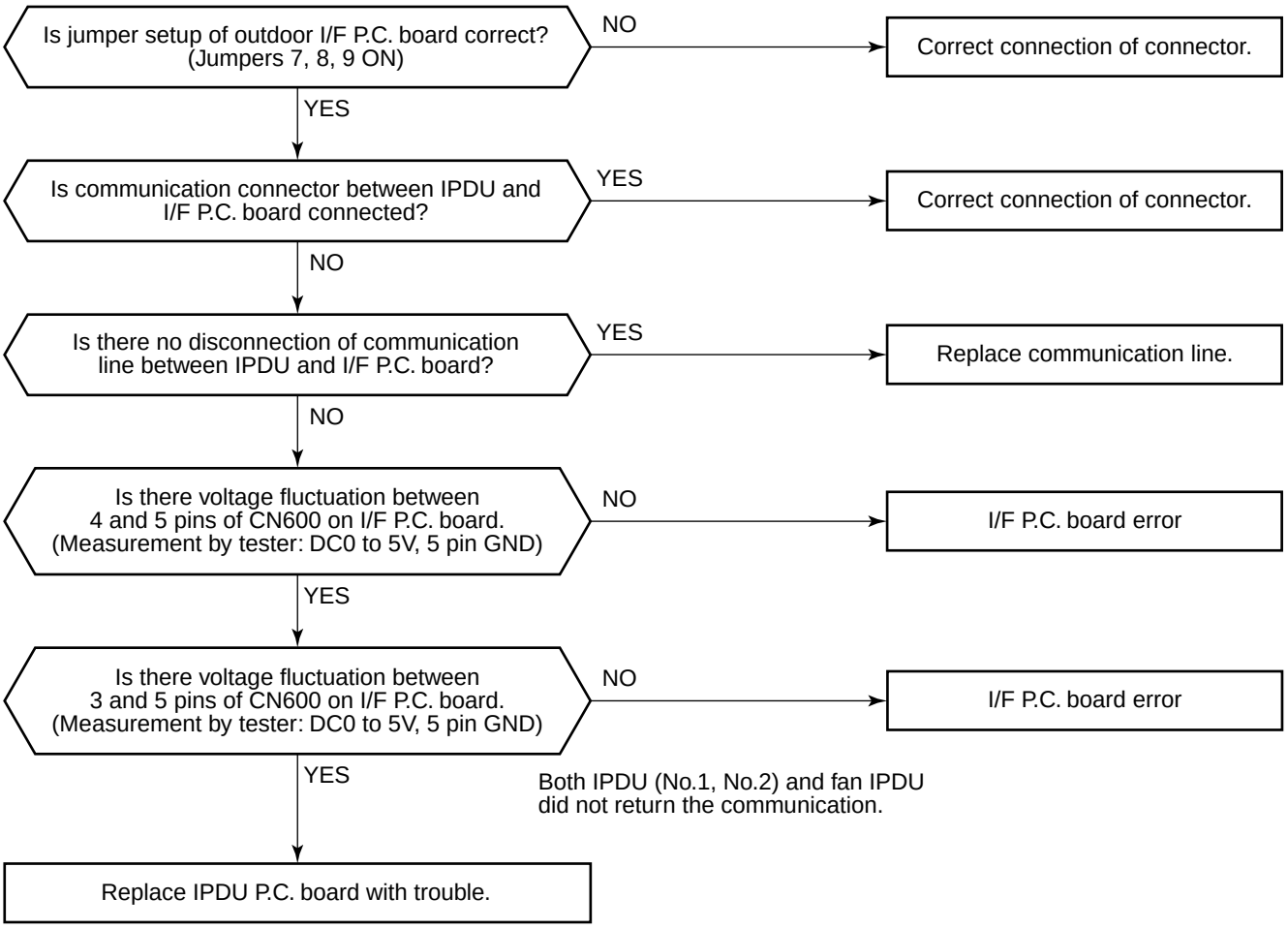


Check code name	Check code name	Cause of operation
[L28] / [46] (d07 / AI-NET)	**Quantity over of connected outdoor units**	1. Quantity over of connected outdoor units. 2. Connection error of communication line between outdoor units 3. Outdoor I/F P.C. board error

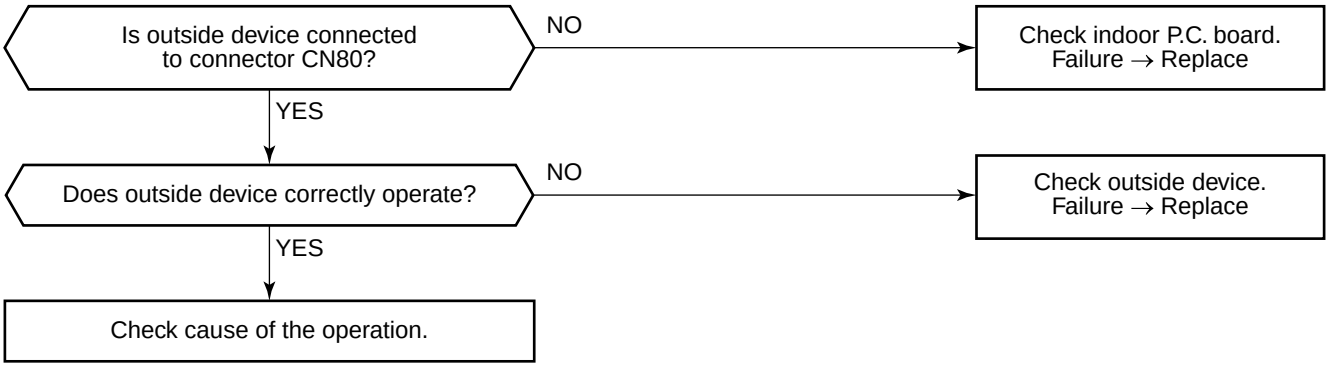


Check code name	Check code name	Cause of operation
[L29] / [CF] (d07 / AI-NET)	**IPDU quantity error**	1. Incorrect model setup in service for I/F P.C. board 2. Communication error between IPDU, fan IPDU and I/F 3. IPDU, fan IPDU, I/F P.C. board error

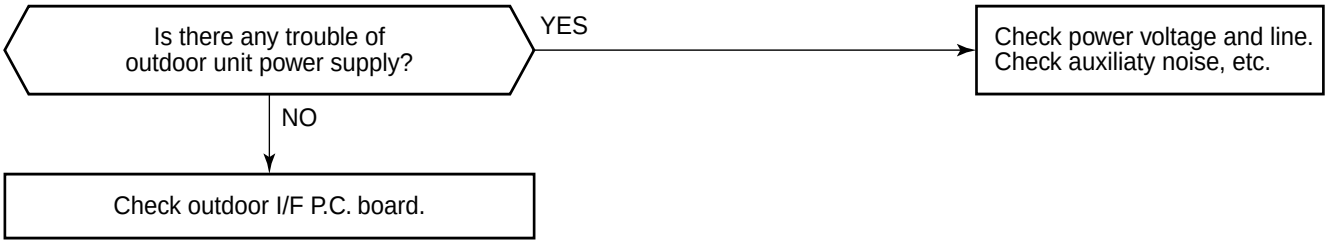
Sub-code:
01: IPDU1 error
02: IPDU2 error
03: IPDU1, 2 error
04: Fan IPDU error
05: IPDU1, fan IPDU error
06: IPDU2, fan IPDU error
07: All IPDU error or disconnection of communication line between IPDU-I/F P.C. board or outdoor I/F P.C. board error



Check code name	Check code name	Cause of operation
[L30] / [b6] (d07 / AI-NET)	**Interlock in indoor unit from outside**	Outside error was input.

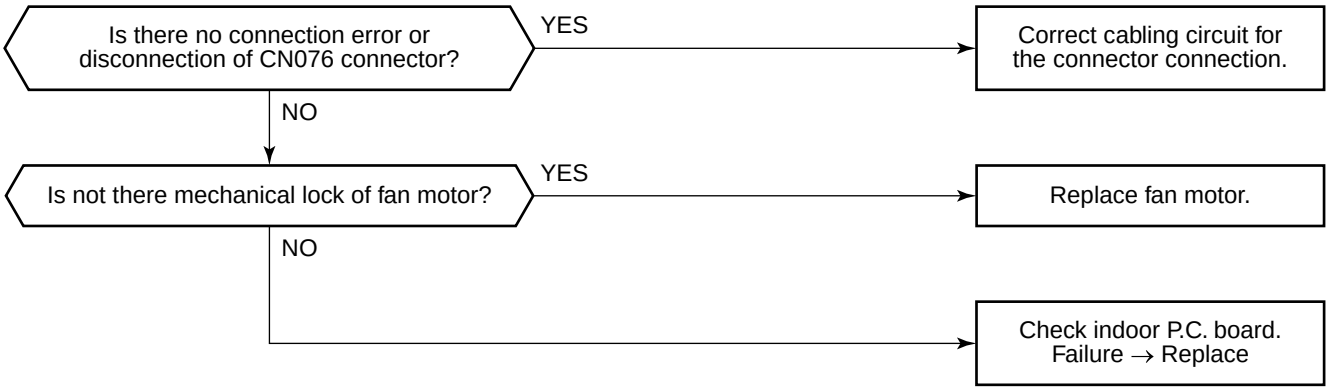


Check code name	Check code name	Cause of operation
[L31] / [–] (d07 / AI-NET)	**Extended IC error**	1. Outdoor unit power error 2. Outdoor I/F P.C. board error

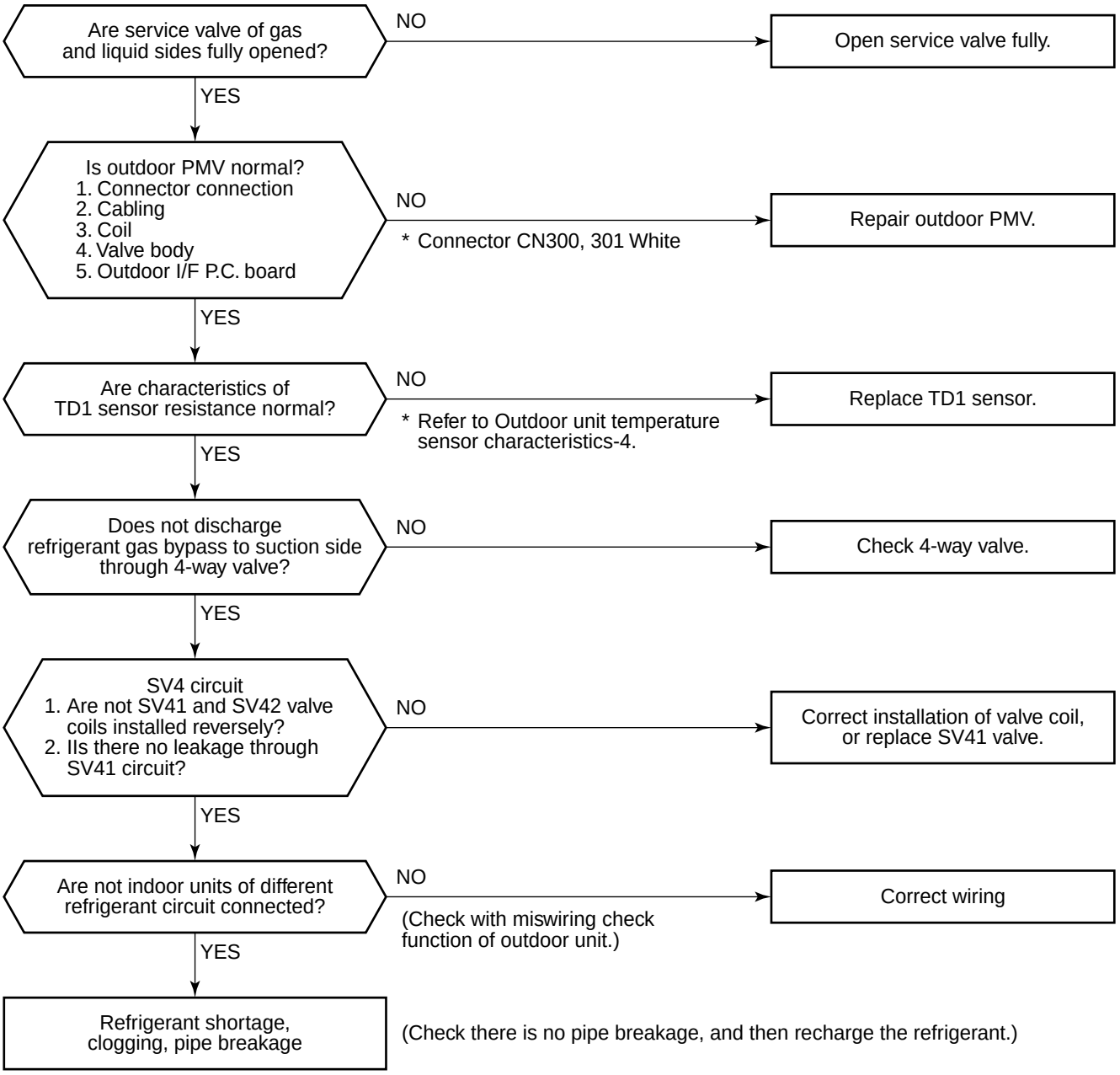


Check code name	Check code name	Cause of operation
[P01] / [11] (d07 / AI-NET)	**Indoor fan motor error**	1. Cabling error 2. Check fan motor.

* For the models installed with AC fan motor only



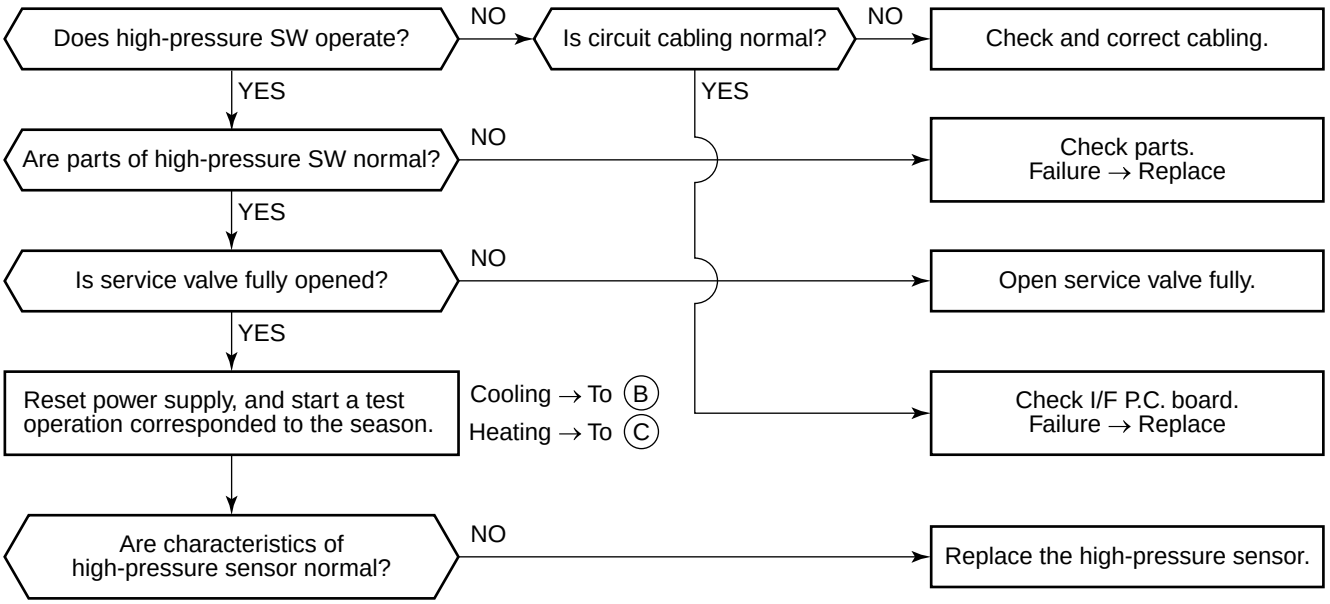
Check code name	Check code name	Cause of operation
[P03] / [1E] (d07 / AI-NET)	**Discharge temp TD1 error**	1. Service valve of outdoor unit closed 2. Outdoor PMV error 3. TD sensor error 4. Refrigerant shortage, clogging of refrigerant circuit system 5. 4-way valve error 6. SV4 circuit leakage, misinstallation

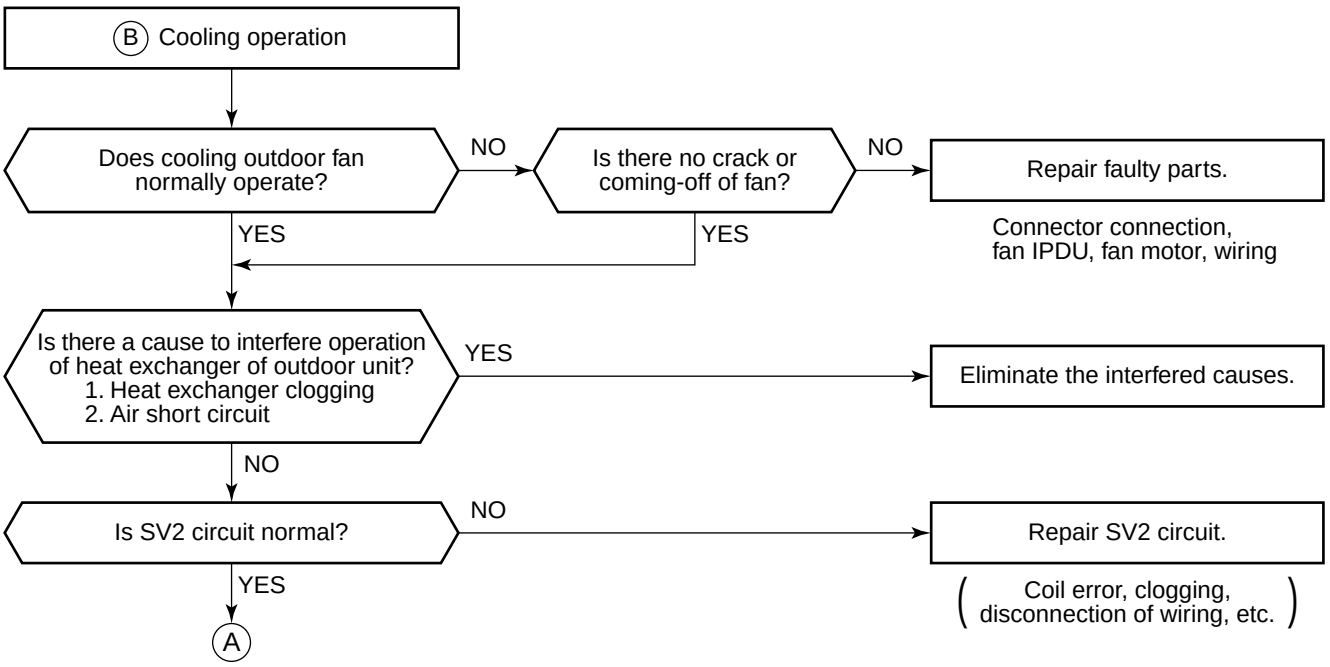


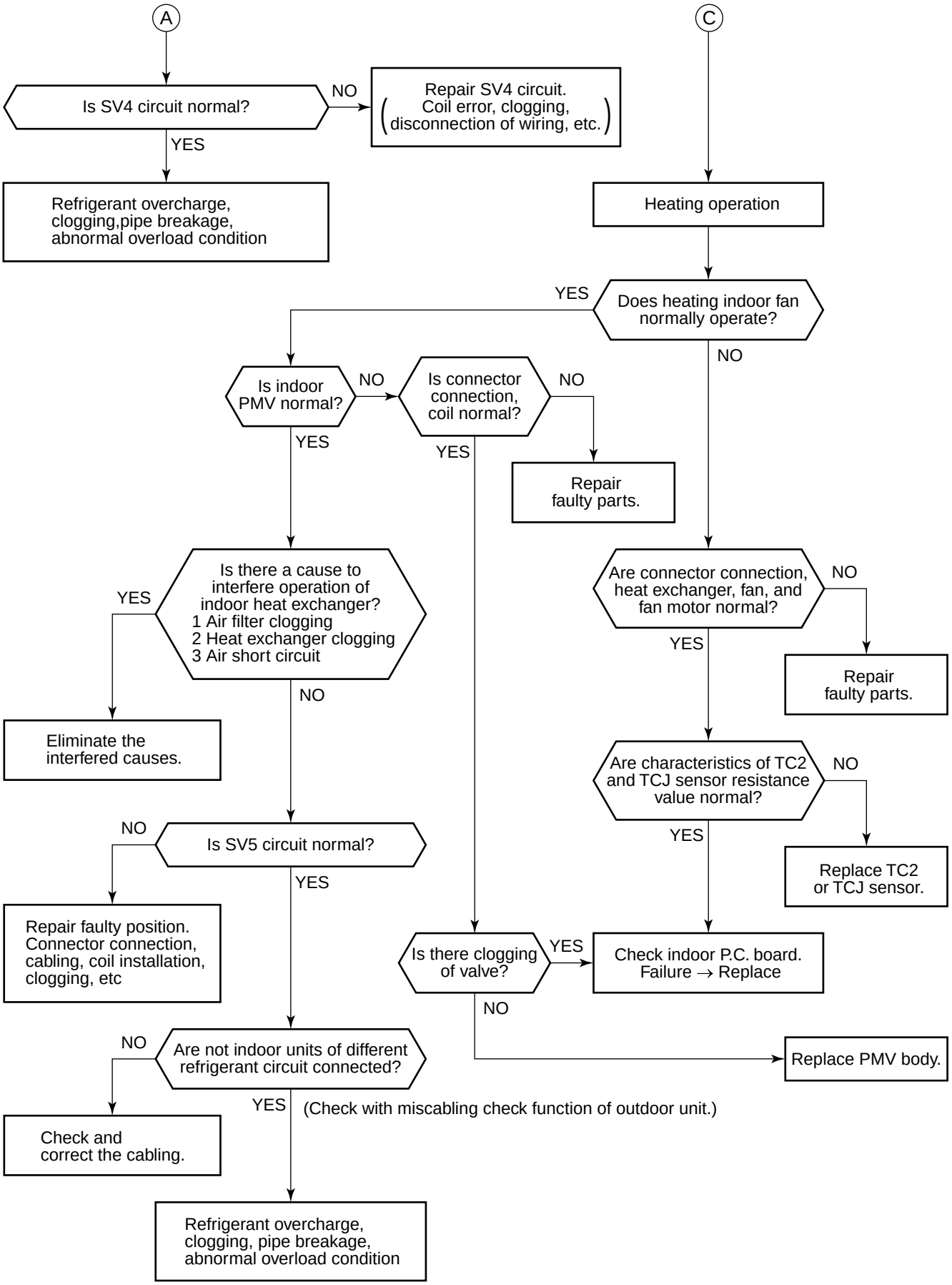
Check code name	Check code name	Cause of operation
[P04] / [21] (d07 / AI-NET)	**Actuation of high-pressure SW**	1. High-pressure SW error 2. Service valve closed 3. Pd sensor error 4. Indoor/outdoor fan error 5. Indoor/outdoor PMV choke 6. Indoor/outdoor heat exchanger clogging, air short circuit 7. SV2 circuit error 8. SV4 circuit error 9. SV5 circuit error 10. Discharge line check valve malfunction 11. Refrigerant overcharge

Sub-code: 01: Compressor 1 side 02: Compressor 2 side

Note) High-pressure SW is normally closed. (B contact)





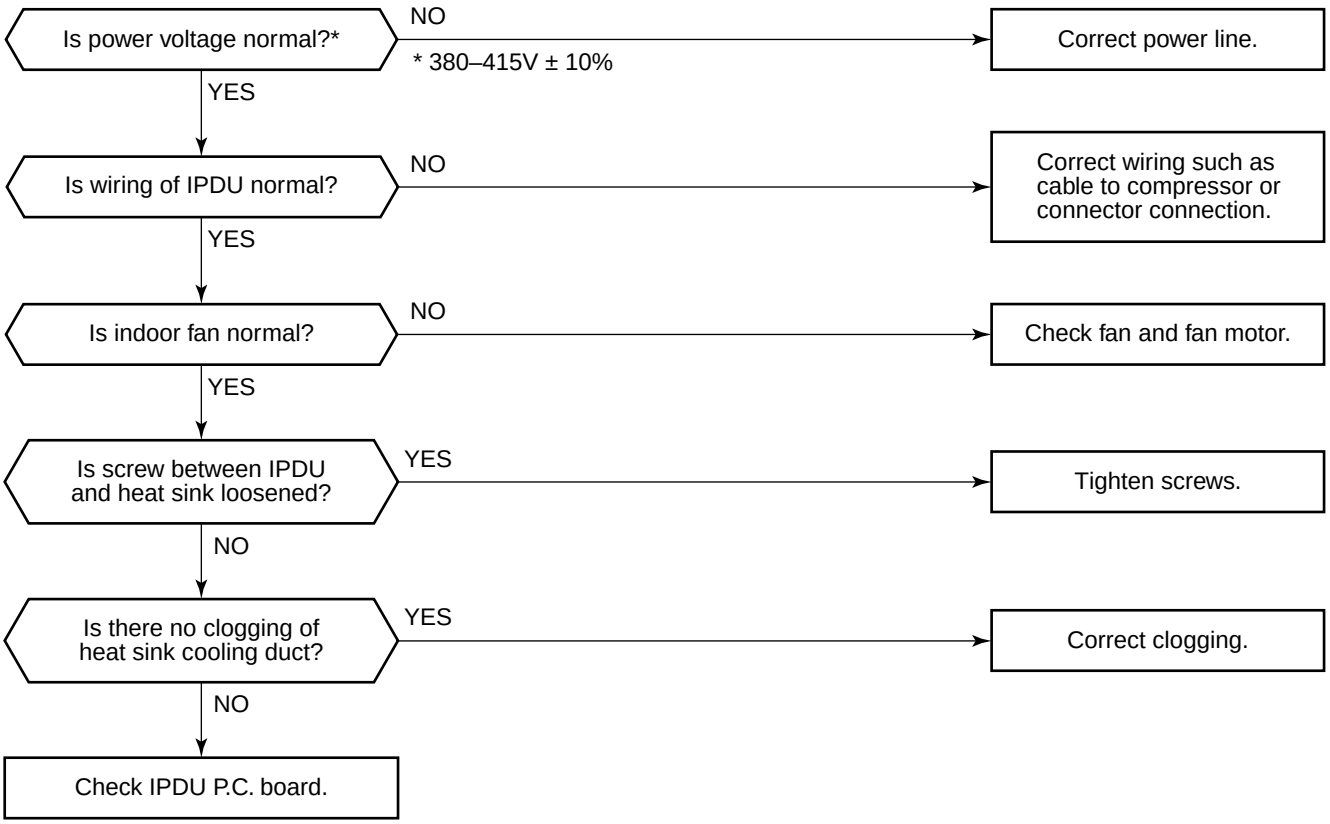

A
Is SV4 circuit normal?
NO
Repair SV4 circuit.
Coil error, clogging,
disconnection of wiring, etc.
YES
Refrigerant overcharge,
clogging,pipe breakage,
abnormal overload condition
C
Heating operation
YES
Does heating indoor fan
normally operate?
NO
Is indoor
PMV normal?
NO
Is connector
connection,
coil normal?
NO
YES
YES
Repair
faulty parts.
Is there a cause to
interfere operation of
indoor heat exchanger?
1 Air filter clogging
2 Heat exchanger clogging
3 Air short circuit
YES
NO
Are connector connection,
heat exchanger, fan, and
fan motor normal?
NO
YES
Repair
faulty parts.
Eliminate the
interfered causes.
Are characteristics of TC2
and TCJ sensor resistance
value normal?
NO
YES
Replace TC2
or TCJ sensor.
NO
Is SV5 circuit normal?
YES
Repair faulty position.
Connector connection,
cabling, coil installation,
clogging, etc
Is there clogging
of valve?
YES
Check indoor P.C. board.
Failure → Replace
NO
Replace PMV body.
NO
Are not indoor units of different
refrigerant circuit connected?
YES
(Check with miscabling check function of outdoor unit.)
Check and
correct the cabling.
Refrigerant overcharge,
clogging, pipe breakage,
abnormal overload condition

Check code name	Check code name	Cause of operation
[P05] / [AF] (d07 / AI-NET)	**Open phase, negative phase**	1. Power supply open phase 2. Power supply negative phase

- Check the phase power line of outdoor unit.
- Check error of outdoor I/F P.C. board.
- Check there is no looseness, etc of terminal.

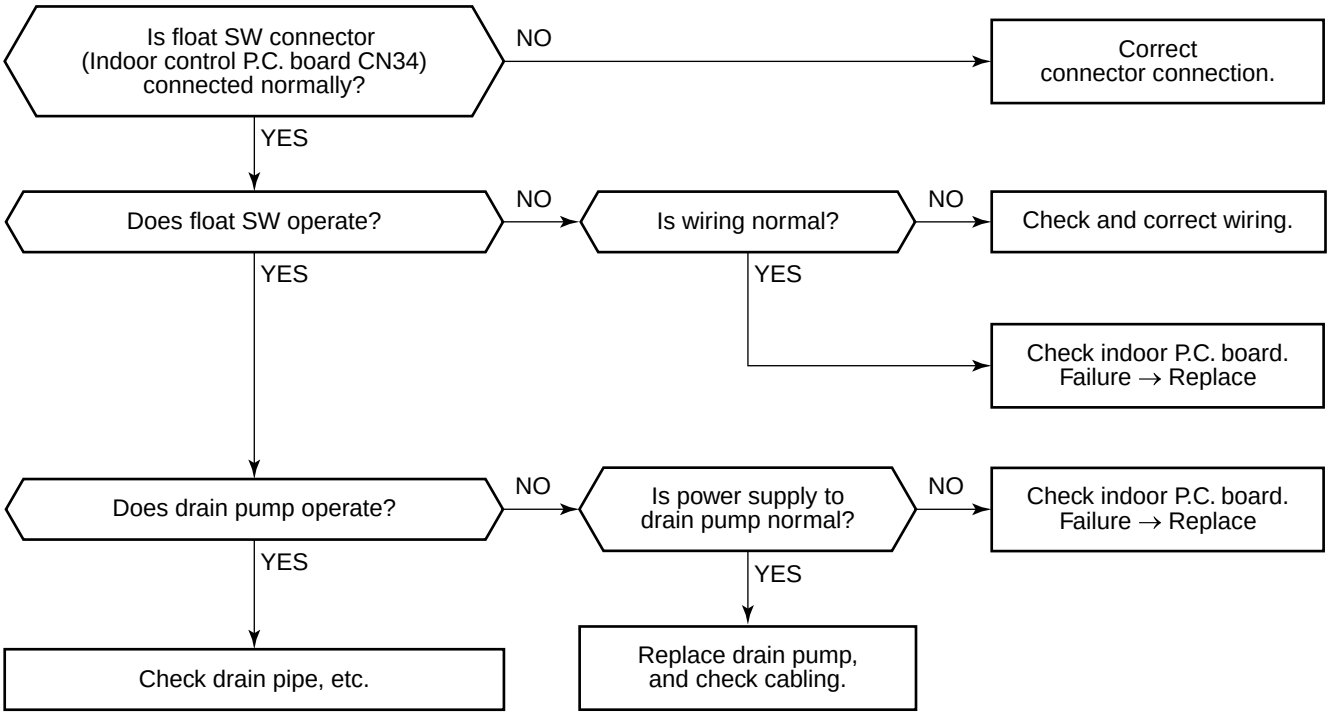
Check code name	Check code name	Cause of operation
[P07] / [1C] (d07 / AI-NET)	**Heat sink overheat error**	1. Power voltage error 2. Outdoor fan system error 3. Heat sink installation error 4. Clogging of hear sink cooling duct 5. IPDU P.C. board error (TH sensor error)

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Check code name	Check code name	Cause of operation
[P10] / [0b] (d07 / AI-NET)	**Indoor overflow error**	1. Float SW operation error 2. Drain pump operation error 3. Clogging of drain pipe 4. Indoor P.C. board error

Sub-code: Indoor address with trouble



- Check there is 380–415V voltage of 1-3 pin of CN68 on indoor P.C. board.

Check code name	Check code name	Cause of operation
[P12] / [11] (d07 / AI-NET)	**Indoor fan motor error**	1. Cabling error of fan motor connector 2. Fan motor error 3. Indoor P.C. board error

Turn off power supply.

* Detectable in model with DC fan motor
(4-way Air Discharge Cassette, or Concealed Duct Standard type)

Is there connection error or disconnection on connector CN333, CN334 of indoor P.C. board (MCC-1402)?

YES → Correct connector connection.

NO

Remove connectors CN333 and CN334 on indoor P.C. board (MCC-1402).

Does fan turn without trouble when turning it with hands?

NO → Replace indoor fan motor.

YES

Is resistance value between each phase at motor side of fan motor connector CN333 on indoor P.C. board (MCC-1402) correct? *1

NO → Replace indoor fan motor.

YES

*1
- Is not winding 1 (Red lead) to 3 (White lead), 3 (White lead) to 5 (Black lead), 5 (Black lead) to 1 (Red lead) opened/shorted? → Resistance value should satisfy the follows.

  [4-way Air Discharge Cassette type]
  MMU-AP0091H, AP0301 → Approx. 70 to 100Ω
  MMU-AP0361H, AP0561 → Approx. 35 to 50Ω

  [Concealed Duct Standard type]
  15 to 35Ω
- Is not grounded between cabinet and 1, 3, 5? → Should be 10Ω or more

Is resistance value at motor side of fan motor connector CN334 on indoor P.C. board (MCC-1402) correct? *2

NO → Replace indoor fan motor.

YES

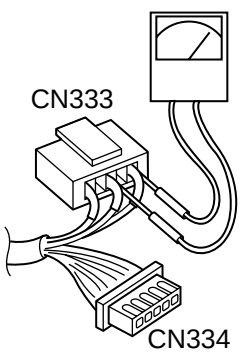
*2
Check resistance value of fan motor position detective circuit.
- Is not winding 1 (Yellow lead) to 4 (Pink lead) opened/shorted? → Resistance should be 5 to 20kΩ

Is output of indoor fan motor position detective signal correct? *3

NO → Replace indoor fan motor.

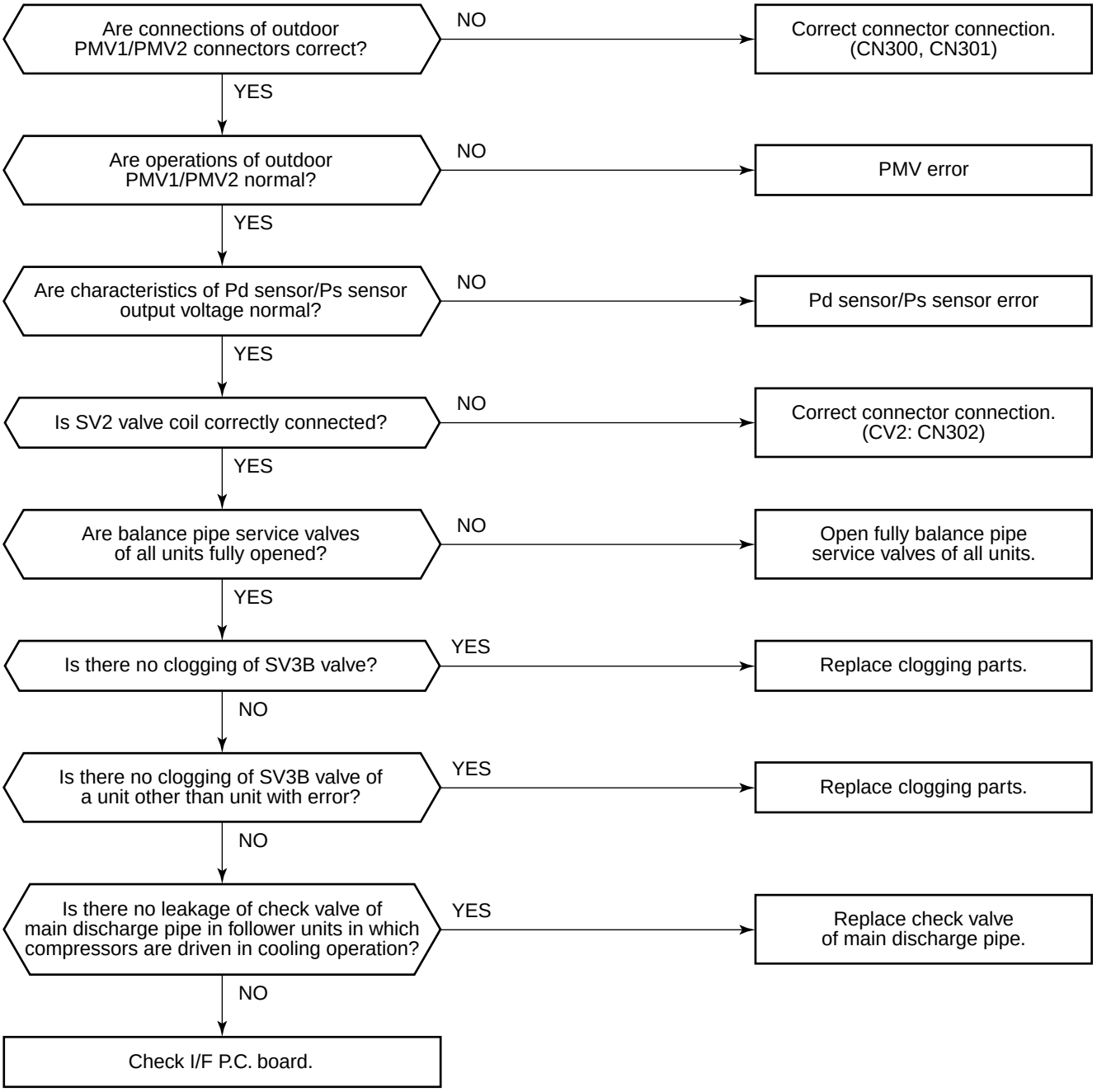
YES

*3
Check fan motor position detective signal.
- Measure voltage with tester between CN334 1 and 5 on indoor P.C. board (MCC-1402) under condition of CN333 and CN334 installed and power-ON.
  → Turn fan slowly with hands so that pin voltage fluctuates between 0 and 5V.
- Between 4 and 5: 5V

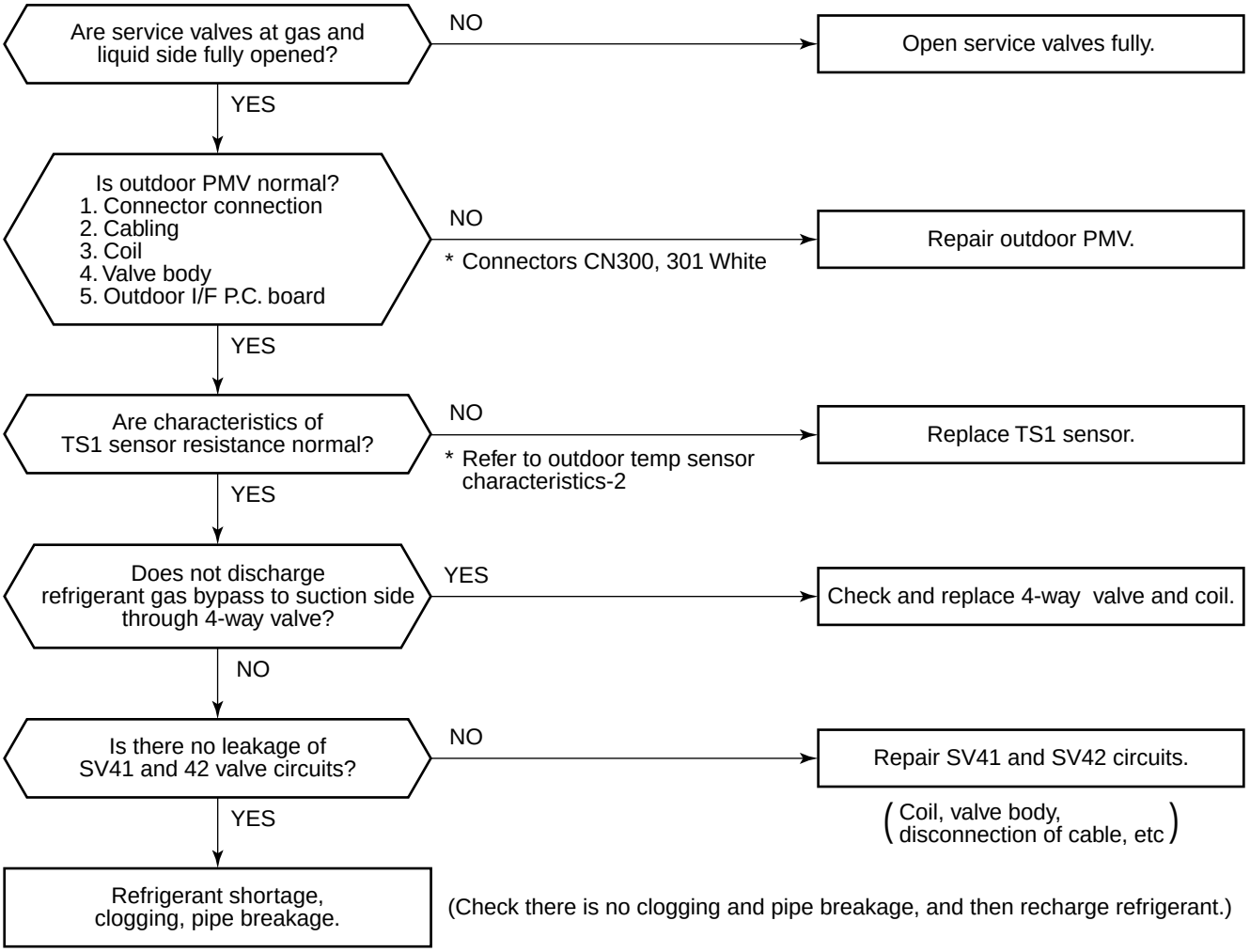


Check indoor P.C. board (MCC-1402).
Failure → Replace

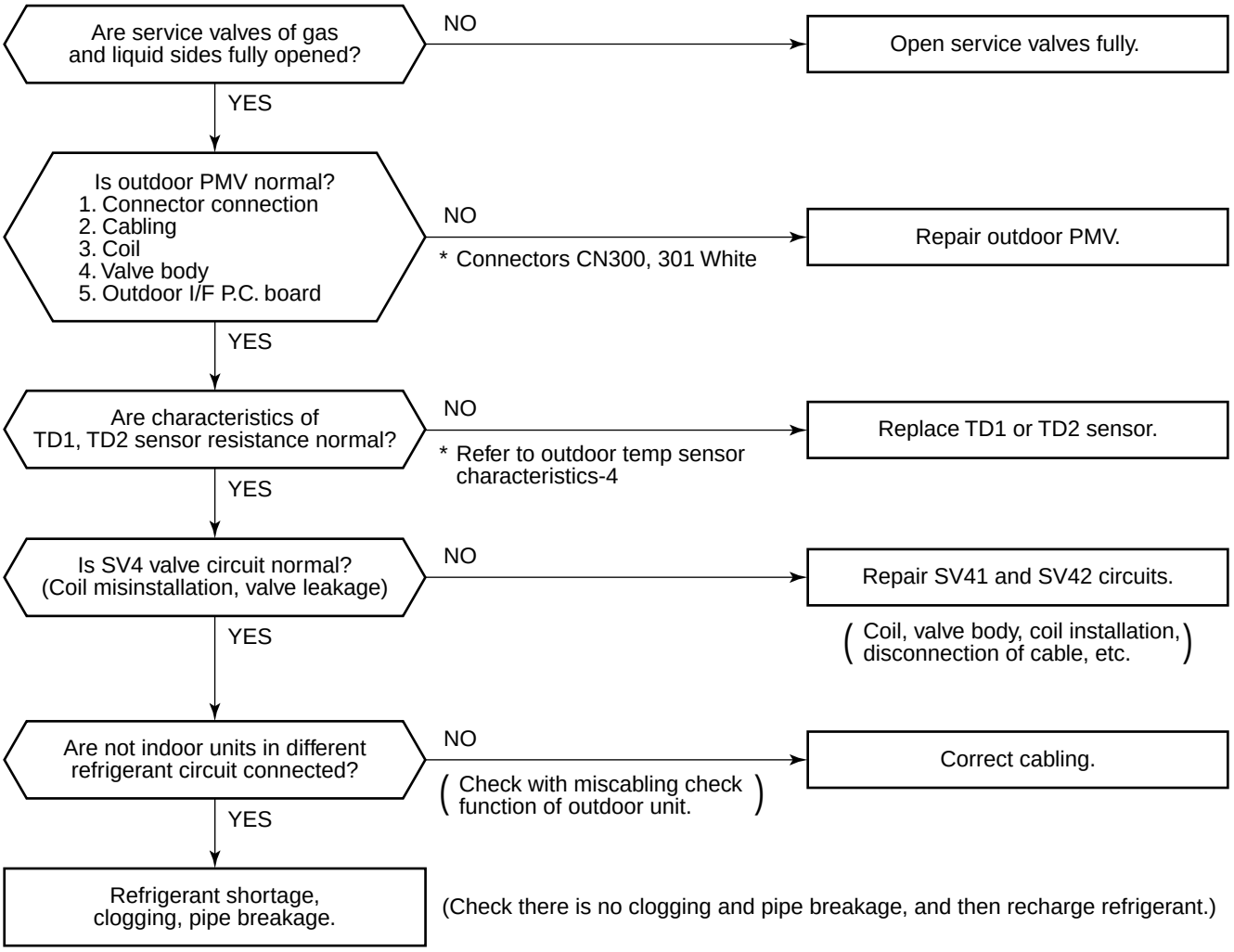
Check code name	Check code name	Cause of operation
[P13] / [47] (d07 / AI-NET)	**Outdoor liquid back detection error**	1. PMV1/PMV2 error 2. Pd sensor, Ps sensor error 3. Clogging of SV2 circuit 4. Clogging of SV3B circuit, balance pipe 5. Leakage of main discharge pipe 6. Outdoor I/F P.C. board error



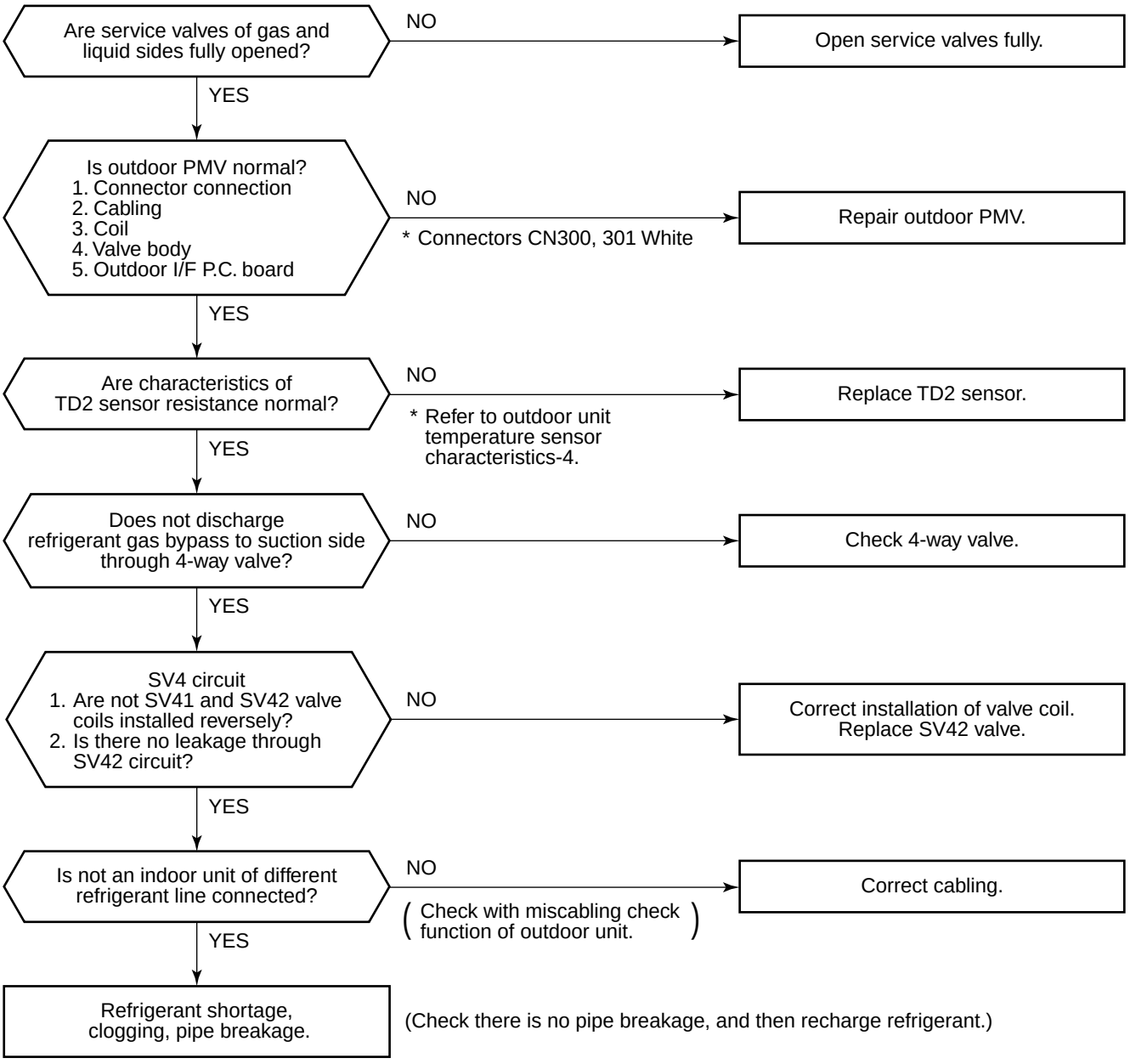
Check code name	Check code name	Cause of operation
[P15] / [AE] (d07 / AI-NET)	**Gas leak detection** **TS condition (Sub-code: 01)**	1. Outdoor unit service valve closed 2. Outdoor PMV error 3. TS1 sensor error 4. Refrigerant shortage, clogging refrigerant circuit 5. 4-way valve error 6. SV4 circuit error



Check code name	Check code name	Cause of operation
[P15] / [AE] (d07 / AI-NET)	**Gas leak detection** **TD condition (Sub-code: 02)**	1. Outdoor unit service valve closed 2. Outdoor PMV error 3. TD sensor error 4. SV4 circuit error 5. Refrigerant shortage, clogging refrigerant circuit

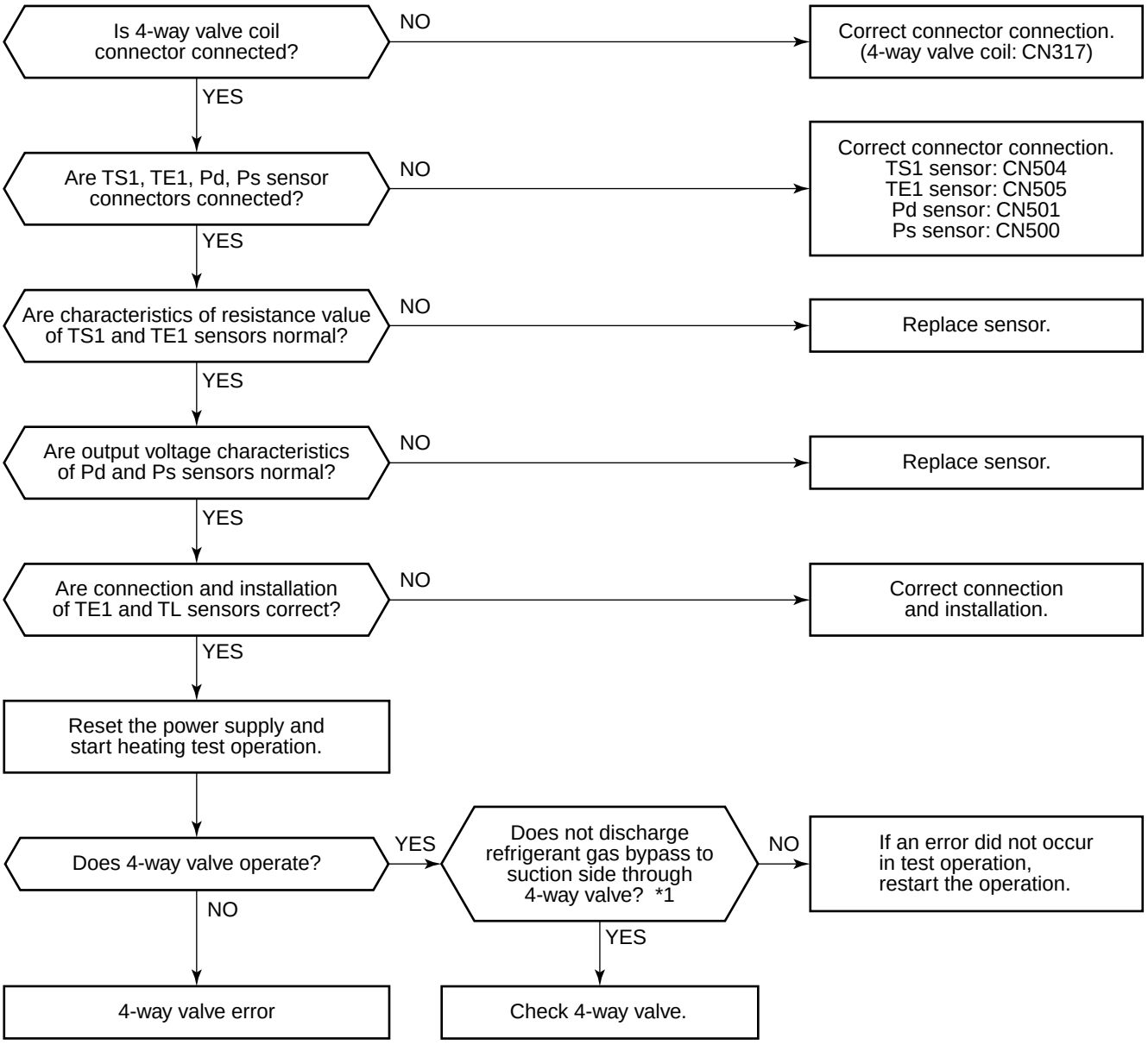


Check code name	Check code name	Cause of operation
[P17] / [bb] (d07 / AI-NET)	**Discharge temp TD2 error**	1. Outdoor unit service valve closed 2. Outdoor PMV error 3. TD sensor error 4. Refrigerant shortage, clogging of refrigerant circuit 5. 4-way valve error 6. SV4 circuit leakage, misinstallation



Check code name	Check code name	Cause of operation
[P19] / [08] (d07 / AI-NET)	**4-way valve operation error**	1. 4-way valve error 2. TS1 sensor/TE1 sensor error 3. Pd sensor/Ps sensor error 4. TE sensor/TL sensor misconnection

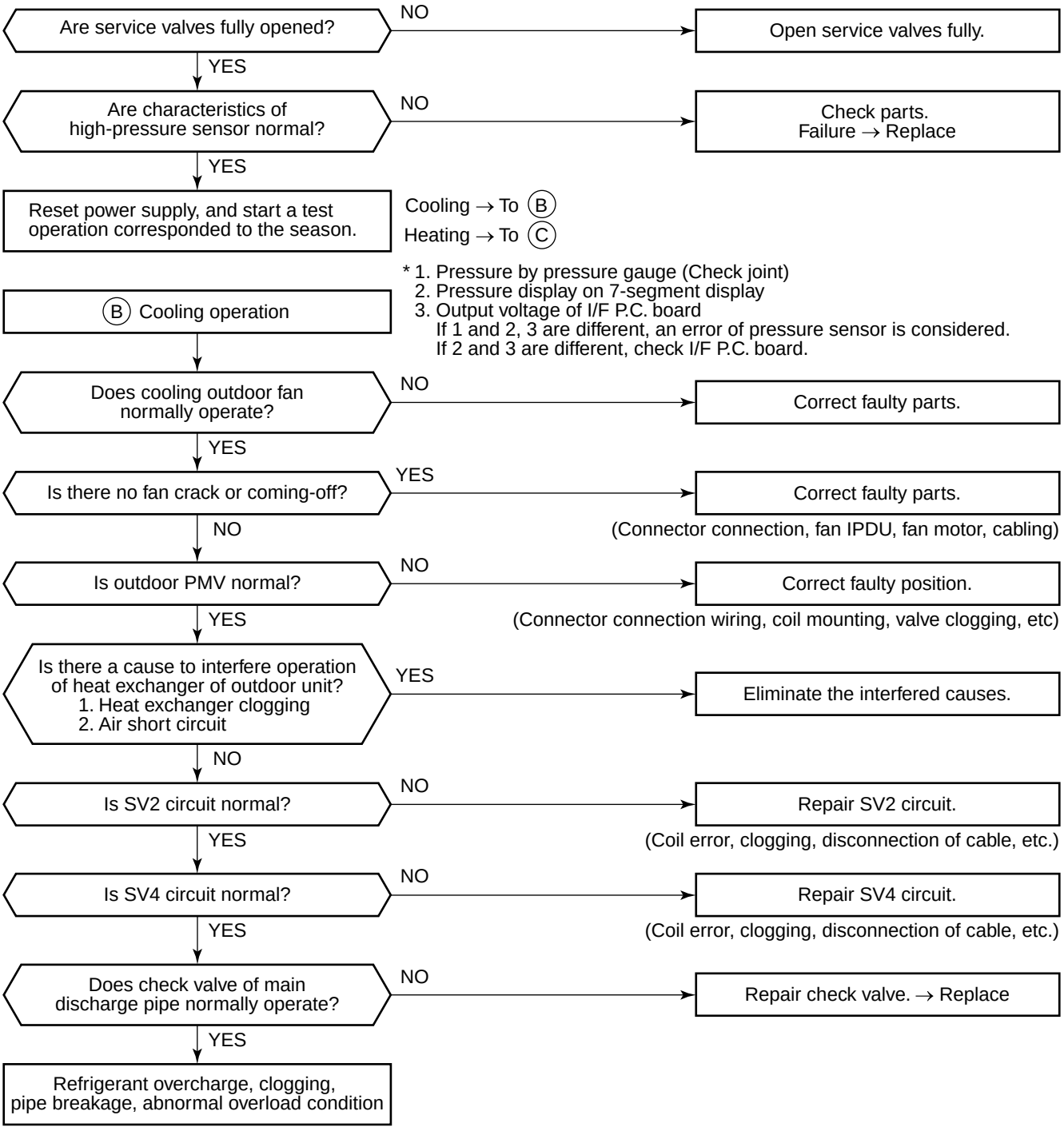
Sub-code: Detected outdoor unit No.

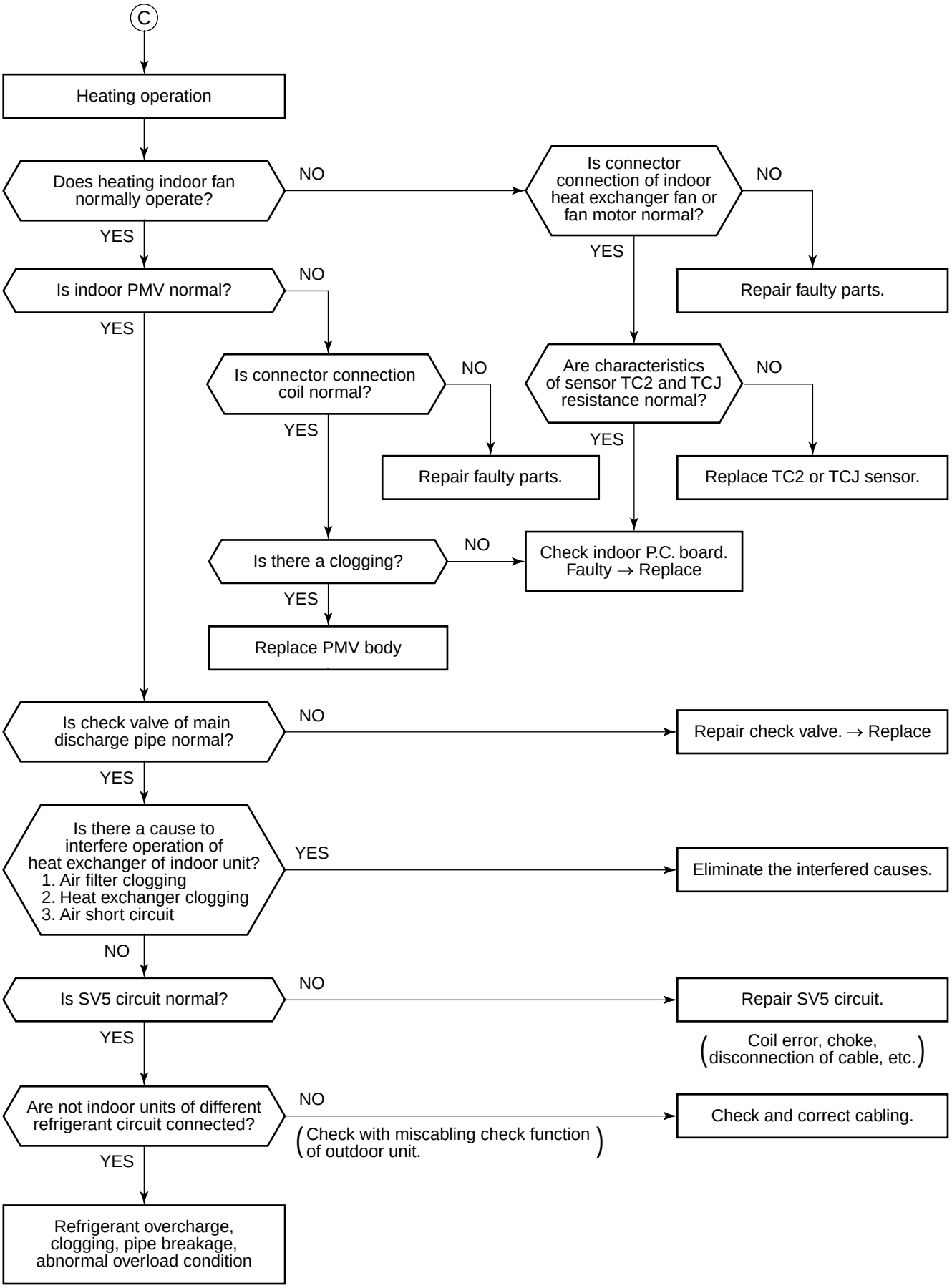


*1 Check TS and TE temperature of the outdoor unit which compressors is operated.
(I/F) SW01=[1], SW02=[6], SW03=[2] → TS sensor temperature
SW01=[1], SW02=[7], SW03=[2] → TE sensor temperature

<Judgment criteria>
TE sensor: Normal if TE ≤ 20˚C except summer season (Outside temp 20˚C or lower)
TS sensor: Normal if TS ≤ 40˚C except summer season (Outside temp 20˚C or lower)

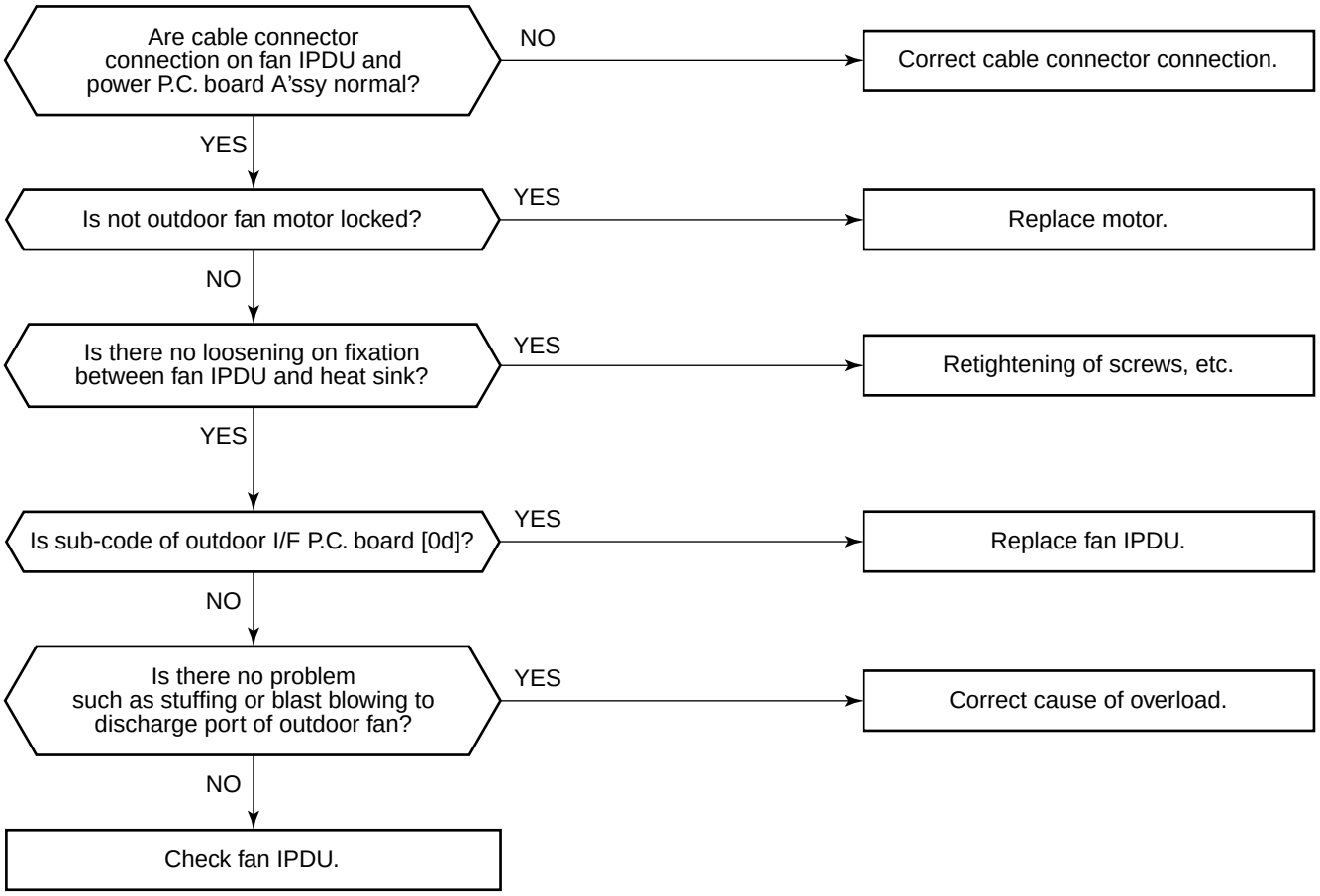
Check code name	Check code name	Cause of operation
[P20] / [22] (d07 / AI-NET)	**High-pressure protective operation**	1. Pd sensor error 2. Service valve closed. 3. Indoor/outdoor fan error 4. Indoor/outdoor PMV clogging 5. Indoor/outdoor heat exchanger clogging 6. SV2 circuit error 7. SV4 circuit error 8. SV5 circuit error 9. Outdoor I/F P.C. board error 10. Operation error of check valve of main discharge pipe 11. Refrigerant overcharge




C
Heating operation
Does heating indoor fan normally operate?
NO
Is connector connection of indoor heat exchanger fan or fan motor normal?
NO
YES
Repair faulty parts.
YES
Is indoor PMV normal?
NO
YES
Is connector connection coil normal?
NO
Are characteristics of sensor TC2 and TCJ resistance normal?
NO
YES
Repair faulty parts.
YES
Replace TC2 or TCJ sensor.
Is there a clogging?
NO
Check indoor P.C. board. Faulty → Replace
YES
Replace PMV body
Is check valve of main discharge pipe normal?
NO
Repair check valve. → Replace
YES
Is there a cause to interfere operation of heat exchanger of indoor unit?
1. Air filter clogging
2. Heat exchanger clogging
3. Air short circuit
YES
Eliminate the interfered causes.
NO
Is SV5 circuit normal?
NO
Repair SV5 circuit.
YES
(Coil error, choke, disconnection of cable, etc.)
Are not indoor units of different refrigerant circuit connected?
NO
Check and correct cabling.
(Check with miscabling check function of outdoor unit.)
YES
Refrigerant overcharge, clogging, pipe breakage, abnormal overload condition

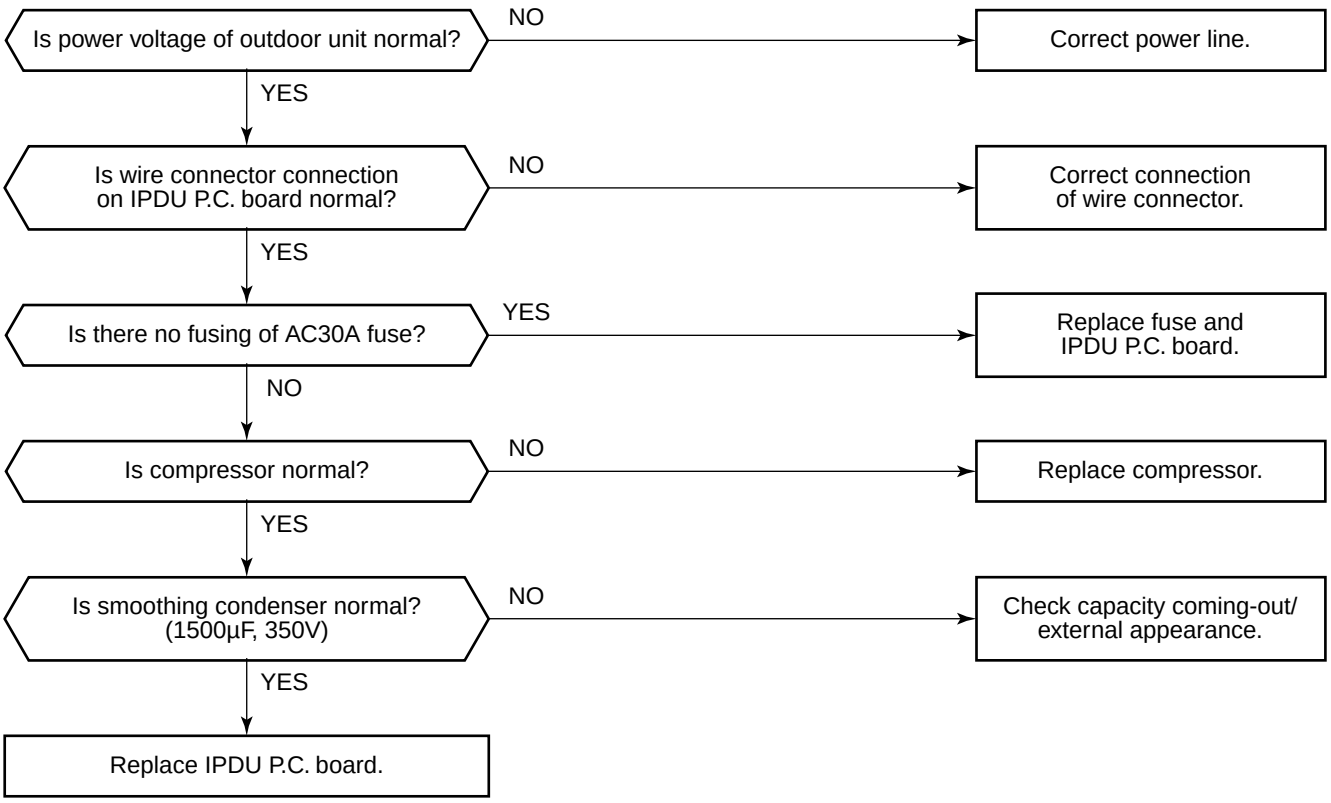
Check code name	Check code name	Cause of operation
[P22] / [1A] (d07 / AI-NET)	**Outdoor fan IPDU error**	1. Fan lock 2. Fan IPDU P.C. board error 3. Overload cause 4. External cause such as blast 5. Fan IPDU power P.C. board error

Sub-code:
0 ∗ : IGBT short circuit
3 ∗ : Motor lock error
C∗ : TH sensor error (Heat sink overheat)
E ∗ : Vdc error
1 ∗ : Position detect circuit error
4 ∗ : Motor current error detected
D∗ : TH sensor error



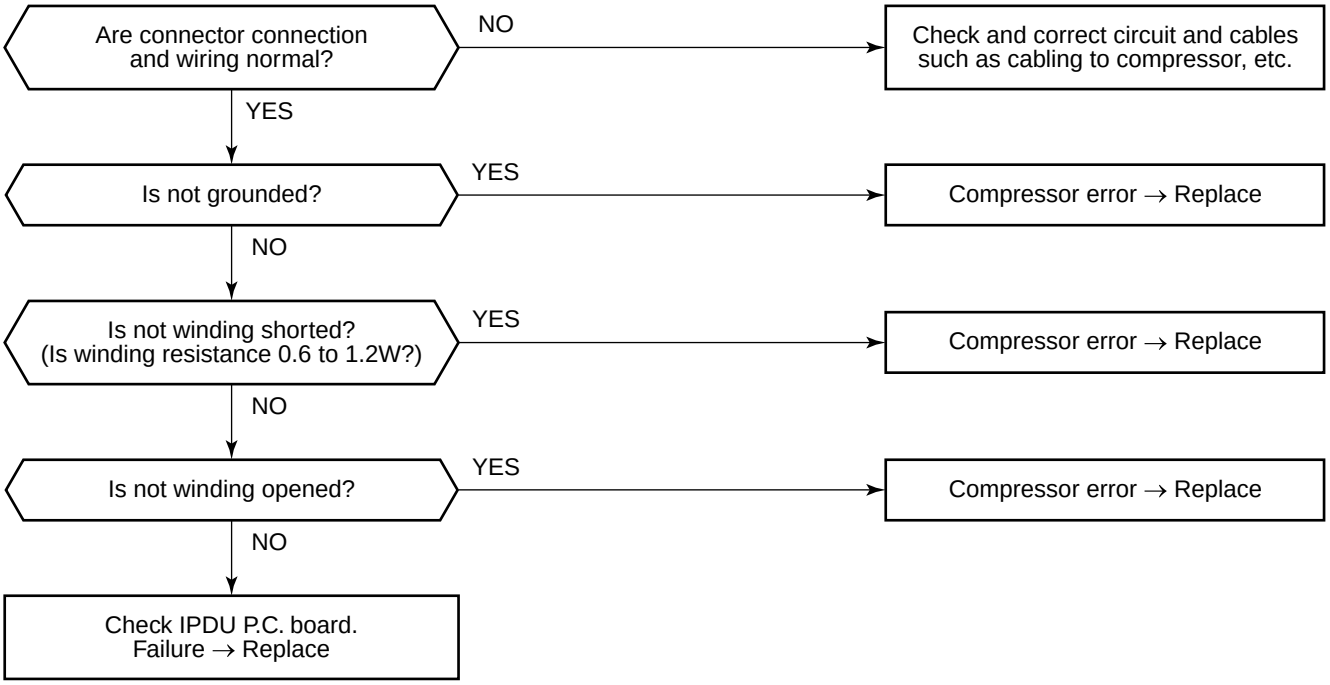
Check code name	Check code name	Cause of operation
[P26] / [14] (d07 / AI-NET)	**G-Tr short-circuit protection error**	1. Outdoor unit power error 2. IPDU error/Cable connection error 3. Compressor error 4. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Check code name	Check code name	Cause of operation
[P29] / [16] (d07 / AI-NET)	**Compressor position detective circuit error**	1) Cable/connector connection error 2) Compressor error 3) IPDU P.C. board error

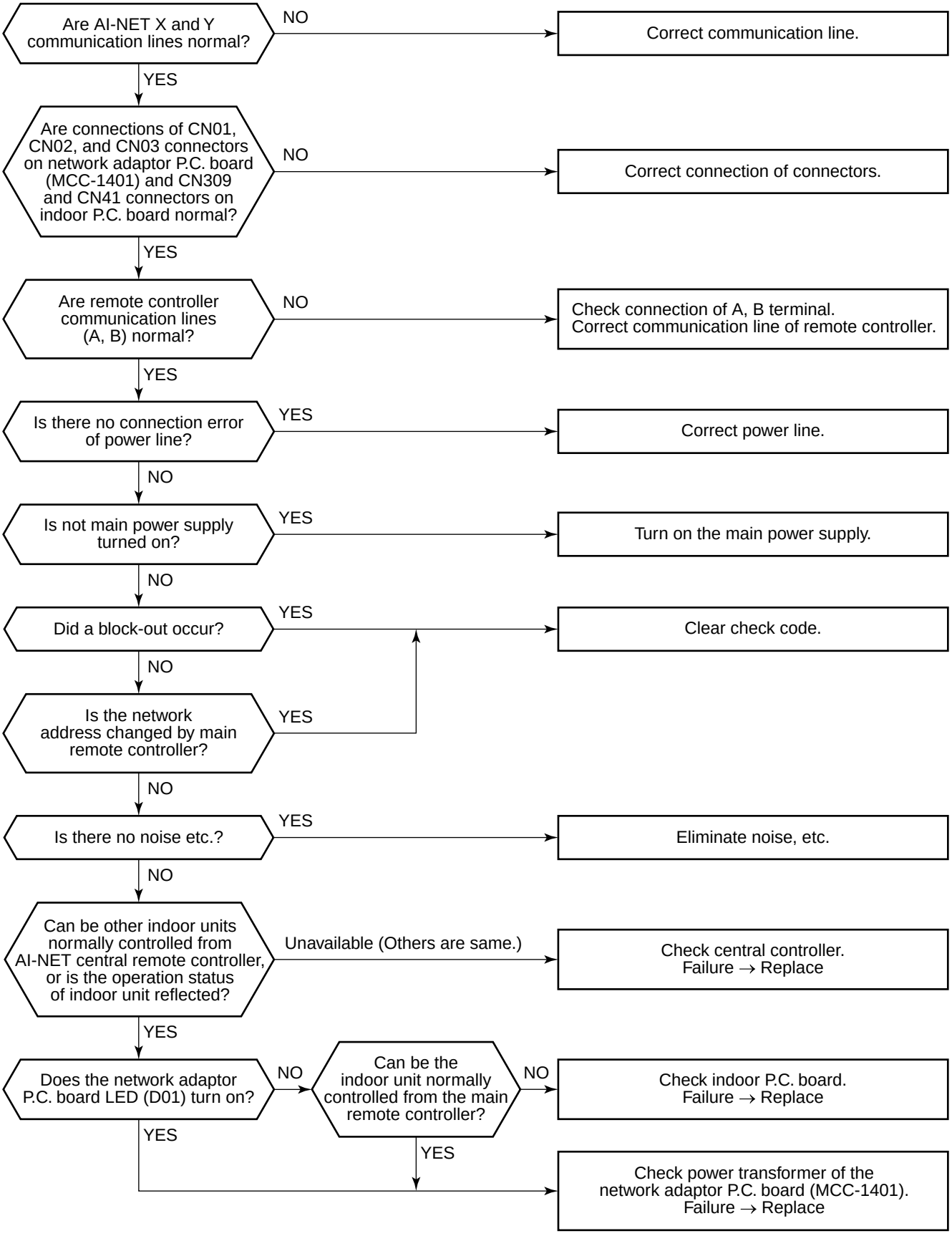
Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Check code name	Check code name	Cause of operation
[P31] / [47] (d07 / AI-NET)	**Other indoor error (Group follower unit error)**	Other indoor unit in the group is abnormal.

When the header unit of the group detected [E03, L03, L07, L08 error], the follower unit of the group displays [P31] error and stops. There are no check code display and alarm record of the main remote controller.

Check code name	Check code name	Cause of operation
[–] / [97] (d07 / AI-NET)	**AI-NET communication line error**	AI-NET communication line error

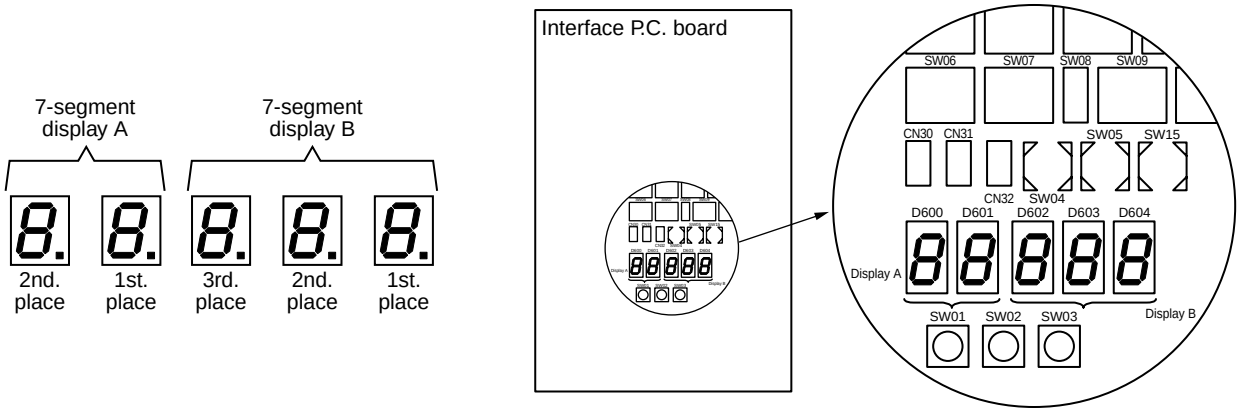


9-6. 7-Segment Display Function

■ 7-segment display on the outdoor unit (Interface P.C. board)

On the interface control P.C. board, 7-segment LED to check the operating status is provided on the control P.C. board.

The displayed contents are changed by combining the setup numbers of the rotary switches (SW01, SW02, and SW03) on P.C. board.



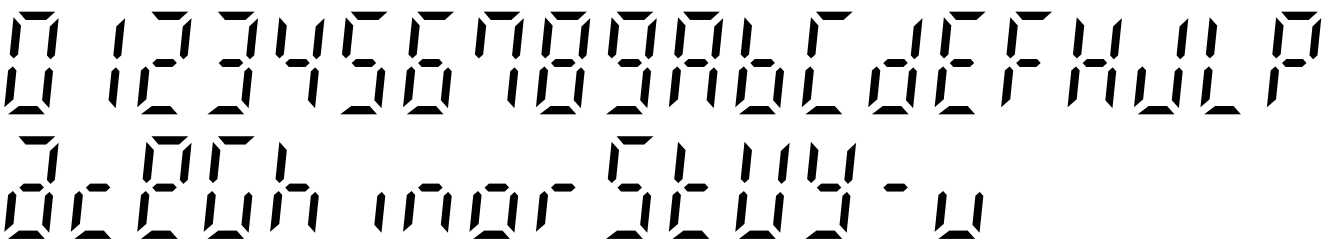
◆ Check procedure in case of stop with trouble

When the system stopped due to a trouble of the outdoor unit, execute a check in the following procedure.

1. Open the panel of the outdoor unit, and then check the 7-segment display.
   The check code is displayed at the right side of 7-segment display B.
   [U1] [○○○] ([○○○]: Check code)
   ∗ Switch setup when confirming the check code: SW01 [1], SW02 [1], SW03 [1]
   However the check code [○○○] is displayed for 3 seconds and the sub-code [○○○] for 1 second are alternately displayed if an sub-code is provided.
2. Confirm the check code, and then conduct the check operation based on the procedure of each check code diagnosis.
3. [U1] [E28] on 7-segment display means a trouble on the follower unit.
   Push the push-switch SW04 on the header unit for two seconds.
   As only the fan of the outdoor unit with a trouble drives, open the panel of the corresponding unit, and then confirm the check code displayed with 7-segment.
4. Perform the check operation based on the procedure of each check code diagnosis.

How to read the check monitor

<7-segment display>



1. Data display of system information (Displayed on the header outdoor unit only)

SW01	SW02	SW03	Display contents				
1	1	3	Refrigerant name	Displays refrigerant name.		A	B
				Model with refrigerant R410A		r4	10A
				Model with refrigerant R407C		r4	07C
	2		System capacity	A	[5] to [48] : 5 to 48HP		
				B	[HP]		
	3		No. of outdoor units	A	[1] to [4] : 1 to 4 units		
				B	[P]		
	4		No. of connected indoor units/ No. of units with cooling thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[C0] to [C48] : 0 to 48 units (No. of units with cooling thermo ON)		
	5		No. of connected indoor units/ No. of units with heating thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[H0] to [H48] : 0 to 48 units (No. of units with heating thermo ON)		
	6		Compressor command correction amount	A	Data is displayed with hexadecimal notation		
				B			
	7		Release control	A	Normal time : [r], During release control: [r1]		
				B	—		
	8		Oil-equalization control	A	Normal time : [oiL-0]		
				B	During oil equation : [oiL-1]		
	9		Oil-equalization request	A	Displays with segment LED lighting pattern		
				B	Display A Display B A F G B E C D Dp U2 U3 U4 F in the left figure goes on: Header requests oil equalization. C in the left figure goes on: Follower requests oil-equalization. (Outdoor unit number)		
	10		Refrigerant/oil recovery operation	A	During sending of cooling refrigerant oil recovery signal : [C1]. Normal time : [C]		
				B	During sending of heating refrigerant oil recovery signal : [H1]. Normal time : [H]		
	11		Automatic address	A	[Ad]		
				B	Automatic addressing : [FF], Normal time : [ ]		
	12		Demand operation	A	[dU]		
				B	Normal time : [ ]. In 50% to 90% : [50 to 90] When controlling by communication line input : [E50 to E90]		
	13		Optional control (P.C. board input)	Displays optioned control status		A	B
				Operation mode selection : In heating with priority (Normal)		h.∗	∗.∗.∗.
					Priority on cooling	c.∗	∗.∗.∗.
					Heating only	H.∗	∗.∗.∗.
					Cooling only	C.∗	∗.∗.∗.
					Priority on No. of operating indoor units	n.∗	∗.∗.∗.
					Priority on specific indoor unit	U.∗	∗.∗.∗.
				Batch start/stop : Normal		∗.⋯.	∗.∗.∗.
					Start input	∗.1.	∗.∗.∗.
					Stop input	∗.0.	∗.∗.∗.
				Night low-noise operation : Normal		∗.∗.	⋯.∗.∗.
					Operation input	∗.∗.	1.∗.∗.
				Snow fan operation : Normal		∗.∗.	∗.⋯.∗.
					Operation input	∗.∗.	∗.1.∗.
	14		Option control (BUS line input)	Same as above			
	15		Unused				
	16		—	A	—		
				B	—		

∗ mark: Indicates none on display

2. Data display of outdoor unit information (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents					
1	1	1	Error data	A	Displays outdoor unit number: [U1] to [U4]			
				B	Displays check code (Latest code only is displayed.) There is no check code: [– – –] There is sub-code: Check code [∗ ∗ ∗] for 3 seconds, sub-code [– ∗ ∗] for 1 second alternately			
			<SW04> push function : Fan of unit with error only drives. 7-segment A: [E1] <SW04 + SW05> push function : Fan of normal unit only drives. 7-segment A: [E0] <SW05> push function : Interruption of fan operation function					
	2		—	A	—			
				B	—			
	3		Operation mode	A	Stop: [ ] Normal cooling: [C], Normal heating: [H], Normal defrost: [J]			
				B	—			
	4		Outdoor unit HP	A	5HP: [5], 6HP: [6], 8HP: [8], 10HP: [10], 12HP: [12]			
				B	[HP]			
	5		Compressor operation command	A	No.1 compressor operation command is displayed. Data display with Hexadecimal notation: [00 to FF]			
				B	No.2 compressor operation command is displayed. Data display with Hexadecimal notation: [00 to FF]			
			<SW04> push function : Inverter frequency is exchanged to decimal notation. 7-segment display (A/B) : [∗ ∗] [∗ ∗ H] (Normal display by pushing <SW05>)					
	6		Outdoor fan step	A	[FP]			
				B	Step 0 to 31: [0 to 31]			
	7		Compressor backup	A	Displays No.1 compressor setup status Normal: [ ], Backup setup: [C1]			
				B	Displays No.2 compressor setup status Normal: [ ], Backup setup: [C2]			
	8		—	A	—			
				B	—			
	9		Control valve output data	Displays control output status of solenoid valve			A	B
				4-way valve: ON			H. 1	⋯ ⋯ ⋯
				4-way valve: OFF			H. 0	⋯ ⋯ ⋯
	10			SV2: ON / SV5: OFF			2. 1	⋯ 5. 0
				SV2: OFF / SV5: ON			2. 0	⋯ 5. 1
	11			SV3A: ON / SV3B: OFF / SV3C: OFF /SV3D: OFF			3. 1	0 0 0
				SV3A: OFF / SV3B: ON / SV3C: OFF /SV3D: OFF			3. 0	1 0 0
				SV3A: OFF / SV3B: OFF / SV3C: ON /SV3D: OFF			3. 0	0 1 0
				SV3A: OFF / SV3B: OFF / SV3C: OFF /SV3D: ON			3. 0	0 0 1
	12			SV41: ON / SV42: OFF			4. ⋯	1 0 ⋯
				SV41: OFF / SV42: ON			4. ⋯	0 1 ⋯
	13			—			⋯ ⋯	⋯ ⋯ ⋯
				—			⋯ ⋯	⋯ ⋯ ⋯
	14		PMV1 /PMV2 opening	Displays opening data (Decimal) (Total opening)			∗ ∗	∗ ∗. P
	15		—	—			⋯ ∗	∗ ∗. P
	16		Oil level judgment status	A	[oL] <SW05> push SW function: The following data is displayed for 2 seconds. * During oil shortage in compressor 1: [L ⋯], during oil shortage in compressor 2: [⋯ L]			
				B	Initial display: [⋯ ⋯ ⋯], Oil level judgment result: [A. #. ∗] Judgment result of compressor 1 in [#], compressor 2 in [∗] (0: Normal, 1, 2: Shortage) is displayed.			

3. Data display of outdoor cycle (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents					
1	1	2	Pd pressure data	Pd pressure (MPaG) is displayed with decimal data. (MPaG: Approx. 1/10 value of kg/cm^{2}G data)			A	B
							P d.	∗. ∗ ∗
	2		Ps pressure data	Ps pressure (MPaG) is displayed with decimal data.			P S.	∗. ∗ ∗
	3		PL pressure conversion data	Estimated pressure of liquid line (MPaG) is displayed with decimal data.			P L.	∗. ∗ ∗
	4		TD1 sensor data	Temperature sensor data (°C) is displayed with decimal notation. • Symbol display for 1 sec. and data display for 3 sec. are alternately displayed. • Data is displayed in [∗]. • Negative data is displayed as [– ∗ ∗ ∗ ∗].		Symbol	t d	1
						Data	∗	∗ ∗. ∗
	5		TD2 sensor data			Symbol	t d	2
						Data	∗	∗ ∗. ∗
	6		TS sensor data			Symbol	t S	
						Data	∗	∗ ∗. ∗
	7		TE sensor data			Symbol	t E	
						Data	∗	∗ ∗. ∗
	8		—			Symbol	—	—
						Data	—	—
	9		TL sensor data			Symbol	t L	
						Data	∗	∗ ∗. ∗
	10		TO sensor data			Symbol	t o	
						Data	∗	∗ ∗. ∗
	11		TK1 sensor data			Symbol	F 1	
						Data	∗	∗ ∗. ∗
	12		TK2 sensor data			Symbol	F 2	
						Data	∗	∗ ∗. ∗
	13		TK3 sensor data			Symbol	F 3	
						Data	∗	∗ ∗. ∗
	14		TK4 sensor data			Symbol	F 4	
						Data	∗	∗ ∗. ∗
	15		—	A	—			
				B	—			
	16		—	A	—			
				B				

4. Data display of outdoor cycle (Displayed on the header unit)

∗ This method is used when information of the follower unit is displayed on 7-segment display of the header unit.

SW01	SW02	SW03	Display contents		
3	1	1 to 3	Error data	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	Check code is displayed. (Latest check code only) No check code: [– – –]
	2		Installed compressor type	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	
	3		Outdoor unit capacity	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	8HP: [··· ··· 8]. 10HP: [··· 1 0], 5 to 12HP
	4		Compressor operation command	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	No.1 compressor ON: [C10], No.2 compressor ON: [C01] For unconnected compressor, " – " is displayed.
	5		Fan operation mode	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	Stop time: [F ··· 0], Mode 31: [F 3 1]
	6		Release signal	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	Normal time: [r ··· ···], Release received: [r ··· 1]
	7		Oil level judgment	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	Normal time: [··· ··· ···], Oil shortage: [··· ··· L]

NOTE) The follower unit is setup by changing SW03.

SW03	1	2	3
7-segment display A	U2	U3	U4

5. Data display of indoor unit information (Displayed on the header unit only)

SW01	SW02	SW03	Display contents		
4	1 to 16	1 to 3	Receiving status of indoor BUS communication	B	Receiving time: [··· ··· 1], Not received: [··· ··· ···]
5			Indoor check code	B	No check code: [– – –]
6			Indoor capacity (HP) horse power	B	0. 2, 0. 5, 0. 8, ··· 1, 1. 2, 1. 7, ··· 2, 2. 5, ··· 3, 3. 2, ··· 4, ··· 5, ··· 6, ··· 8, 1 0, 1 6, 2 0
7			Indoor request command (S code)	B	Data is displayed with Hexadecimal notation [··· ··· 0 to ··· ··· F] : Heating
8			Indoor PMV opening data	B	Data is displayed with Hexadecimal notation
9			Indoor TA sensor data	B	Data is displayed with Hexadecimal notation
10			Indoor TF sensor data	B	Data is displayed with Hexadecimal notation
11			Indoor TCJ sensor data	B	Data is displayed with Hexadecimal notation
12			Indoor TC1 sensor data	B	Data is displayed with Hexadecimal notation
13			Indoor TC2 sensor data	B	Data is displayed with Hexadecimal notation

NOTE) Indoor address No. is chosen by changing SW02 and SW03.

SW03	SW02	Indoor address	7-segment display A
1	1 to 16	SW02 setup number	[01] to [16]
2	1 to 16	SW02 setup number + 16	[17] to [32]
3	1 to 16	SW02 setup number + 32	[33] to [48]

6. Outdoor EEPROM write-in error code display (Displayed on the header unit only)

∗ The latest error code written in EEPROM of each outdoor unit is displayed.
(It is used when confirming the error code after power supply has been reset.)

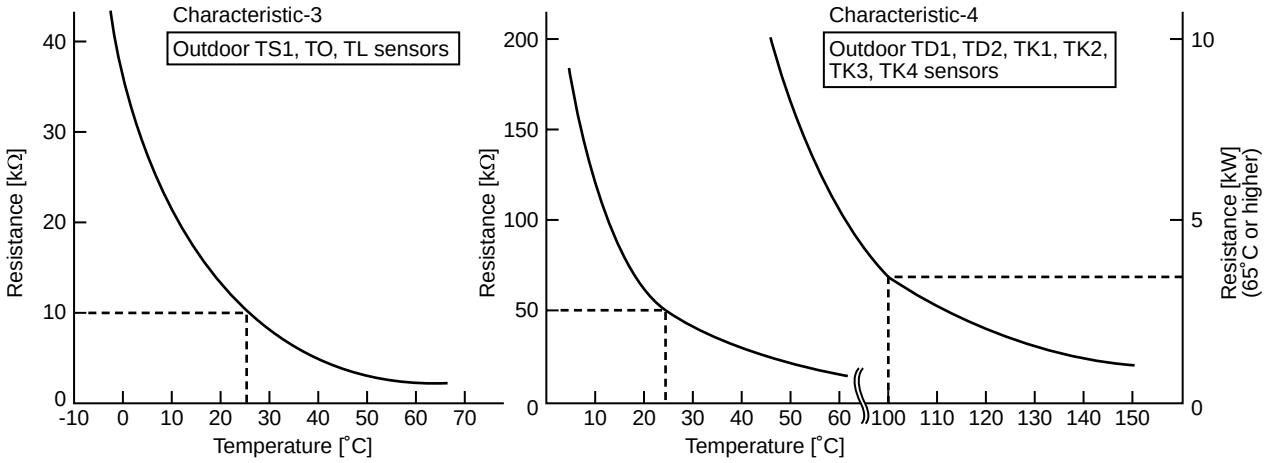
Set SW01 to 03 as shown in the following table, and the push SW04 for 5 seconds or more to display an error code.

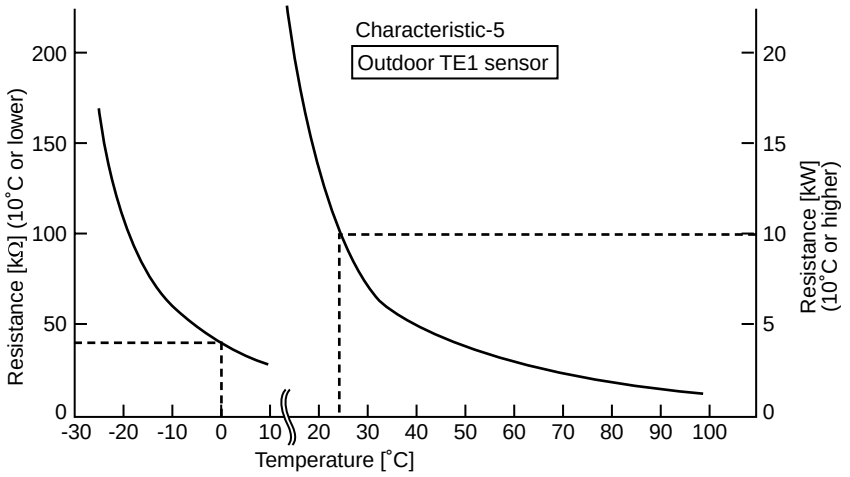
SW01	SW02	SW03	Display contents	7-segment display	
				A	B
1	1	16	The latest error code of the header unit 1 (U1)	E. r	1. – –
	2		The latest error code of the follower unit 1 (U2)	E. r	2. – –
	3		The latest error code of the follower unit 2 (U3)	E. r	3. – –
	4		The latest error code of the follower unit 3 (U4)	E. r	4. – –

9-7. Sensor Characteristics

9-7-1. Outdoor Unit

■ Temperature sensor characteristics





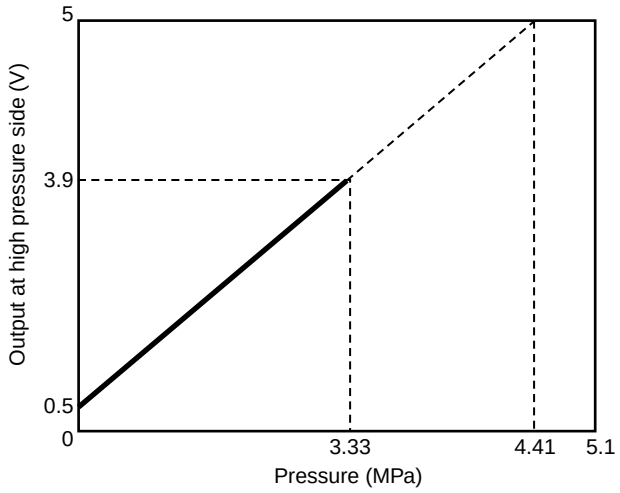
■ Pressure sensor characteristics

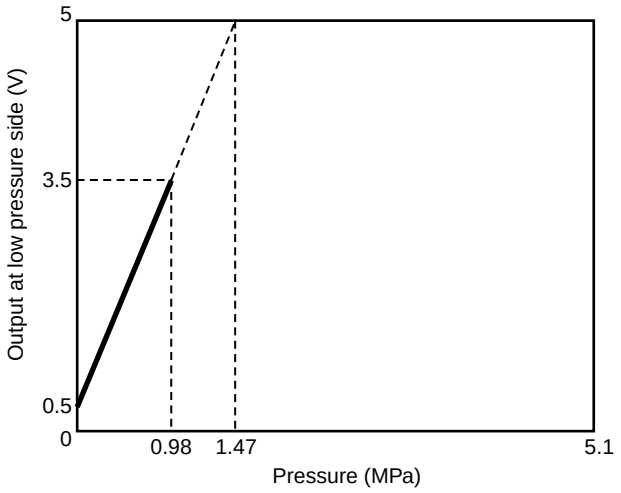
• I/O cable connection table

Pin No.	High pressure side (Pd)		Low pressure side (Ps)	
	Input/Output name	Lead wire color	Input/Output name	Lead wire color
1	OUTPUT	White	—	—
2	—	—	OUTPUT	White
3	GND	Black	GND	Black
4	+5V	Red	+5V	Red

• Output voltage — Pressure

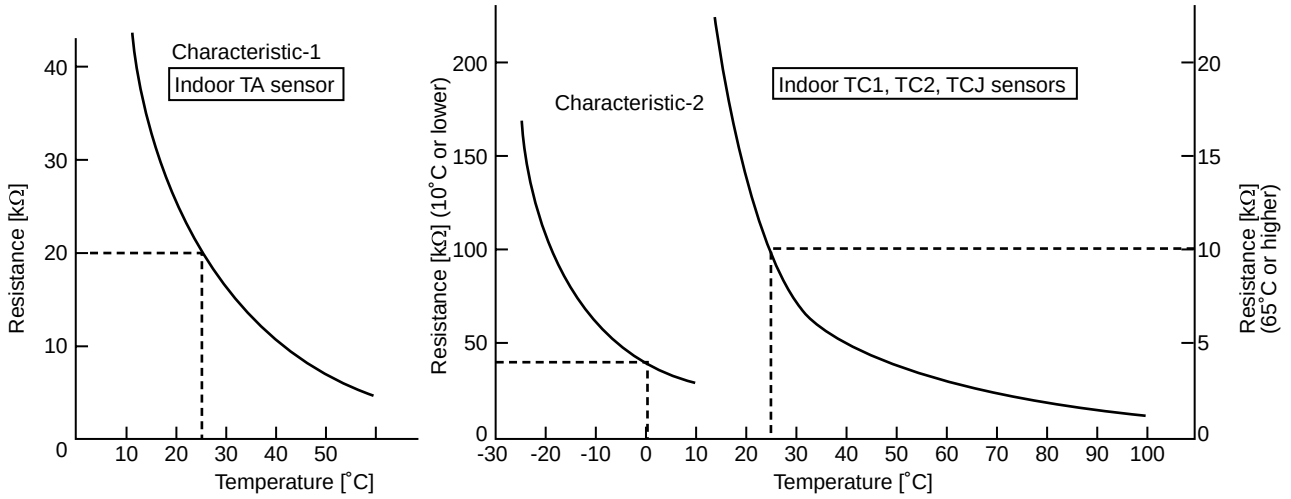
High pressure side (Pd)	Low pressure side (Ps)
0.5 to 3.9 V DC	0.5 to 3.5 V DC
0 to 3.33 MPa	0 to 0.98 MPa





9-7-2. Indoor Unit

■ Temperature sensor characteristics



9-8. Pressure Sensor Output Check

9-8-1. Outdoor Unit

■ Pd sensor characteristics

0 to 4.41MPa (0.5 to 5V output with 0 to 4.41MPa)
Voltage check between CN501 ② and ③ pins on the outdoor unit I/F P.C. board (Tester ⊖ rod at ③ pin side)

VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)
0.00	0.00	0.0	1.00	0.49	5.0	1.99	1.46	14.9	2.99	2.44	24.9	3.98	3.42	34.8
0.02	0.00	0.0	1.02	0.51	5.2	2.01	1.48	15.1	3.01	2.46	25.1	4.00	3.44	35.0
0.04	0.00	0.0	1.04	0.53	5.4	2.03	1.50	15.3	3.03	2.48	25.3	4.02	3.45	35.2
0.06	0.00	0.0	1.06	0.54	5.5	2.05	1.52	15.5	3.05	2.50	25.5	4.04	5.48	35.4
0.08	0.00	0.0	1.07	0.56	5.7	2.07	1.54	15.7	3.07	2.52	25.7	4.06	3.49	35.6
0.10	0.00	0.0	1.09	0.58	5.9	2.09	1.56	15.9	3.09	2.54	25.9	4.08	3.51	35.8
0.12	0.00	0.0	1.11	0.60	6.1	2.11	1.58	16.1	3.11	2.56	26.1	4.10	3.53	36.0
0.14	0.00	0.0	1.13	0.62	6.3	2.13	1.60	16.3	3.13	2.57	26.3	4.12	3.55	36.2
0.16	0.00	0.0	1.15	0.64	6.5	2.15	1.62	16.5	3.15	2.59	26.4	4.14	3.57	36.4
0.18	0.00	0.0	1.17	0.66	6.7	2.17	1.64	16.7	3.16	2.61	26.6	4.16	3.59	36.6
0.20	0.00	0.0	1.19	0.68	6.9	2.19	1.66	16.9	3.18	2.63	26.8	4.18	3.61	36.8
0.22	0.00	0.0	1.21	0.70	7.1	2.21	1.67	17.1	3.20	2.65	27.0	4.20	3.63	37.0
0.23	0.00	0.0	1.23	0.72	7.3	2.23	1.69	17.3	3.22	2.67	27.2	4.22	3.65	37.2
0.25	0.00	0.0	1.25	0.74	7.5	2.25	1.71	17.5	3.24	2.69	27.4	4.24	3.67	37.4
0.27	0.00	0.0	1.27	0.76	7.7	2.27	1.73	17.7	3.26	2.71	27.6	4.26	3.69	37.6
0.29	0.00	0.0	1.29	0.77	7.9	2.29	1.75	17.9	3.28	2.73	27.8	4.28	3.70	37.8
0.31	0.00	0.0	1.31	0.79	8.1	2.31	1.77	18.0	3.30	2.75	28.0	4.30	3.72	38.0
0.33	0.00	0.0	1.33	0.81	8.3	2.32	1.79	18.2	3.32	2.77	28.2	4.32	3.74	38.2
0.35	0.00	0.0	1.35	0.83	8.5	2.34	1.81	18.4	3.34	2.79	28.4	4.24	3.76	38.4
0.37	0.00	0.0	1.37	0.85	8.7	2.36	1.83	18.6	3.36	2.80	28.6	4.36	3.78	38.6
0.39	0.00	0.0	1.39	0.87	8.9	2.38	1.85	18.8	3.38	2.82	28.8	4.38	3.80	38.8
0.41	0.00	0.0	1.41	0.89	9.1	2.40	1.87	19.0	3.40	2.84	29.0	4.40	3.82	38.9
0.43	0.00	0.0	1.43	0.91	9.3	2.42	1.89	19.2	3.42	2.86	29.2	4.41	3.84	39.1
0.45	0.00	0.0	1.45	0.93	9.5	2.44	1.90	19.4	3.44	2.88	29.4	4.43	3.86	39.3
0.47	0.00	0.0	1.47	0.95	9.6	2.46	1.92	19.6	3.46	2.90	29.6	4.45	3.88	39.5
0.49	0.00	0.0	1.48	0.97	9.8	2.48	1.94	19.8	3.48	2.92	29.8	4.47	3.90	39.7
0.51	0.01	0.1	1.50	0.99	10.0	2.50	1.96	20.0	3.50	2.94	30.0	4.49	3.92	39.9
0.53	0.03	0.3	1.52	1.00	10.2	2.52	1.98	20.2	3.52	2.96	30.2	4.51	3.93	40.1
0.55	0.05	0.5	1.54	1.02	10.4	2.54	2.00	20.4	3.54	2.98	3.04	4.53	3.95	40.3
0.57	0.07	0.7	1.56	1.04	10.6	2.56	2.02	20.6	3.56	3.00	30.5	4.55	3.97	40.5
0.59	0.08	0.9	1.58	1.06	10.8	2.58	2.04	20.8	3.57	3.02	30.7	4.57	3.99	40.7
0.61	0.10	1.1	1.60	1.08	11.0	2.60	2.06	21.0	3.59	3.03	30.9	4.59	4.01	40.9
0.63	0.12	1.3	1.62	1.10	11.2	2.62	2.08	21.2	3.61	3.05	31.1	4.61	4.03	41.1
0.65	0.14	1.4	1.64	1.12	11.4	2.64	1.10	21.4	3.63	3.07	31.3	4.63	4.05	41.3
0.66	0.16	1.6	1.66	1.14	11.6	2.66	2.12	21.6	3.65	3.09	31.5	4.65	4.07	41.5
0.68	0.18	1.8	1.68	1.16	11.8	2.68	2.13	21.8	3.67	3.11	31.7	4.67	4.09	41.7
0.70	0.20	2.0	1.70	1.18	12.0	2.70	2.15	22.0	3.69	3.13	31.9	4.69	4.11	41.9
0.72	0.22	2.2	1.72	1.20	12.2	2.72	2.17	22.2	3.71	3.15	32.1	4.71	4.13	42.1
0.74	0.24	2.4	1.74	1.21	12.4	2.73	2.19	22.3	3.73	3.17	32.3	4.73	4.15	42.3
0.76	0.26	2.6	1.76	1.23	12.6	2.75	2.21	22.5	3.75	3.19	32.5	4.75	4.16	42.5
0.78	0.28	2.8	1.78	1.25	12.8	2.77	2.23	22.7	3.77	3.21	32.7	4.77	4.18	42.7
0.80	0.30	3.0	1.80	1.27	13.0	2.79	2.25	22.9	3.79	3.23	32.9	4.79	4.20	42.9
0.82	0.31	3.2	1.82	1.29	13.2	2.81	2.27	23.1	3.81	3.25	33.1	4.81	4.22	43.0
0.84	0.33	3.4	1.84	1.31	13.4	2.83	2.29	23.3	3.83	3.26	33.3	4.82	4.24	43.2
0.86	0.35	3.6	1.86	1.33	13.6	2.85	2.31	23.5	3.85	3.28	33.5	4.84	4.26	43.4
0.88	0.37	3.8	1.88	1.35	13.8	2.87	2.33	23.7	3.87	3.30	33.7	4.86	4.28	43.6
0.90	0.39	4.0	1.90	1.37	13.9	2.89	2.35	23.9	3.89	3.32	33.9	4.88	4.30	43.8
0.92	0.41	4.2	1.91	1.39	14.1	2.91	2.36	24.1	3.91	3.34	34.1	4.90	4.32	44.0
0.94	0.43	4.4	1.93	1.41	14.3	2.93	2.38	24.3	3.93	3.36	34.3	4.92	4.34	44.2
0.96	0.45	4.6	1.95	1.43	14.5	2.95	2.40	24.5	3.95	3.38	34.5	4.94	4.36	44.4
0.98	0.47	4.8	1.97	1.44	14.7	2.97	2.42	24.7	3.97	3.40	34.7	4.96	4.38	44.6
												4.98	4.39	44.8

9-8-2. Outdoor Unit

■ Ps sensor characteristics

0 to 4.41MPa (0.5 to 5V output with 0 to 4.41MPa)
Voltage check between CN500 ② and ③ pins on the outdoor unit I/F P.C. board (Tester ⊖ rod at ③ pin side)

VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)
0.00	0.00	0.0	1.00	0.16	1.7	1.99	0.49	5.0	2.99	0.81	8.3	3.98	1.14	11.6
0.02	0.00	0.0	1.02	0.17	1.7	2.01	0.49	5.0	3.01	0.82	8.4	4.00	1.15	11.7
0.04	0.00	0.0	1.04	0.18	1.8	2.03	0.50	5.1	3.03	0.83	8.4	4.02	1.15	11.7
0.06	0.00	0.0	1.06	0.18	1.8	2.05	0.51	5.2	3.05	0.83	8.5	4.04	1.16	11.8
0.08	0.00	0.0	1.07	0.19	1.9	2.07	0.51	5.2	3.07	0.84	8.6	4.06	1.17	11.9
0.10	0.00	0.0	1.09	0.19	2.0	2.09	0.52	5.3	3.09	0.85	8.6	4.08	1.17	11.9
0.12	0.00	0.0	1.11	0.20	2.0	2.11	0.53	5.4	3.11	0.85	8.7	4.10	1.18	12.0
0.14	0.00	0.0	1.13	0.21	2.1	2.13	0.53	5.4	3.13	0.86	8.8	4.12	1.18	12.1
0.16	0.00	0.0	1.15	0.21	2.2	2.15	0.54	5.5	3.15	0.86	8.8	4.14	1.19	12.1
0.18	0.00	0.0	1.17	0.22	2.2	2.17	0.55	5.6	3.16	0.87	8.9	4.16	1.20	12.2
0.20	0.00	0.0	1.19	0.23	2.3	2.19	0.55	5.6	3.18	0.88	8.9	4.18	1.20	12.3
0.22	0.00	0.0	1.21	0.23	2.4	2.21	0.56	5.7	3.20	0.88	9.0	4.20	1.21	12.3
0.23	0.00	0.0	1.23	0.24	2.4	2.23	0.56	5.8	3.22	0.89	9.1	4.22	1.22	12.4
0.25	0.00	0.0	1.25	0.25	2.5	2.25	0.57	5.8	3.24	0.90	9.1	4.24	1.22	12.5
0.27	0.00	0.0	1.27	0.25	2.6	2.27	0.58	5.9	3.26	0.90	9.2	4.26	1.23	12.5
0.29	0.00	0.0	1.29	0.26	2.6	2.29	0.58	6.0	3.28	0.91	9.3	4.28	1.24	12.6
0.31	0.00	0.0	1.31	0.26	2.7	2.31	0.59	6.0	3.30	0.92	9.3	4.30	1.24	12.7
0.33	0.00	0.0	1.33	0.27	2.8	2.32	0.60	6.1	3.32	0.92	9.4	4.32	1.25	12.7
0.35	0.00	0.0	1.35	0.28	2.8	2.34	0.60	6.1	3.34	0.93	9.5	4.34	1.25	12.8
0.37	0.00	0.0	1.37	0.28	2.9	2.36	0.61	6.2	3.36	0.94	9.5	4.36	1.26	12.9
0.39	0.00	0.0	1.39	0.29	3.0	2.38	0.62	6.3	3.38	0.94	9.6	4.38	1.27	12.9
0.41	0.00	0.0	1.41	0.30	3.0	2.40	0.62	6.3	3.40	0.95	9.7	4.40	1.27	13.0
0.43	0.00	0.0	1.43	0.30	3.1	2.42	0.63	6.4	3.42	0.95	9.7	4.41	1.28	13.0
0.45	0.00	0.0	1.45	0.31	3.2	2.44	0.64	6.5	3.44	0.96	9.8	4.43	1.29	13.1
0.47	0.00	0.0	1.47	0.32	3.2	2.46	0.64	6.5	3.46	0.97	9.9	4.45	1.29	13.2
0.49	0.00	0.0	1.48	0.32	3.3	2.48	0.65	6.6	3.48	0.97	9.9	4.47	1.30	13.2
0.51	0.00	0.0	1.50	0.33	3.3	2.50	0.65	6.7	3.50	0.98	10.0	4.49	1.31	13.3
0.53	0.01	0.1	1.52	0.34	3.4	2.52	0.66	6.7	3.52	0.99	10.1	4.51	1.31	13.4
0.55	0.02	0.3	1.54	0.34	3.5	2.54	0.67	6.8	3.54	0.99	10.1	4.53	1.32	13.4
0.57	0.02	0.2	1.56	0.35	3.5	2.56	0.67	6.9	3.56	1.00	10.2	4.55	1.32	13.5
0.59	0.03	0.3	1.58	0.35	3.6	2.58	0.68	6.9	3.57	1.01	10.2	4.57	1.33	13.6
0.61	0.03	0.4	1.60	0.36	3.7	2.60	0.69	7.0	3.59	1.01	10.3	4.59	1.34	13.6
0.63	0.04	0.4	1.62	0.37	3.7	2.62	0.69	7.1	3.61	1.02	10.4	4.61	1.34	13.7
0.65	0.05	0.5	1.64	0.37	3.8	2.64	0.70	7.1	3.63	1.02	10.4	4.63	1.35	13.8
0.66	0.05	0.5	1.66	0.38	3.9	2.66	0.71	7.2	3.65	1.03	10.5	4.65	1.36	13.8
0.68	0.06	0.6	1.68	0.39	3.9	2.68	0.71	7.3	3.67	1.04	10.6	4.67	1.36	13.9
0.70	0.07	0.7	1.70	0.39	4.0	2.70	0.72	7.3	3.69	1.04	10.6	4.69	1.37	14.0
0.72	0.07	0.7	1.72	0.40	4.1	2.72	0.72	7.4	3.71	1.05	10.7	4.71	1.38	14.0
0.74	0.08	0.8	1.74	0.41	4.1	2.73	0.73	7.4	3.73	1.06	10.8	4.73	1.38	14.1
0.76	0.09	0.9	1.76	0.41	4.2	2.75	0.74	7.5	3.75	1.06	10.8	4.75	1.39	14.2
0.78	0.09	0.9	1.78	0.42	4.3	2.77	0.74	7.6	3.77	1.07	10.9	4.77	1.39	14.2
0.80	0.10	1.0	1.80	0.42	4.3	2.79	0.75	7.6	3.79	1.08	11.0	4.79	1.40	14.3
0.82	0.11	1.1	1.82	0.43	4.4	2.81	0.76	7.7	3.81	1.08	11.0	4.81	1.41	14.3
0.84	0.11	1.1	1.84	0.44	4.5	2.83	0.76	7.8	3.83	1.09	11.1	4.82	1.41	14.4
0.86	0.12	1.2	1.86	0.44	4.5	2.85	0.77	7.8	3.85	1.09	11.2	4.84	1.42	14.5
0.88	0.12	1.3	1.88	0.45	4.6	2.87	0.78	7.9	3.89	1.10	11.2	4.86	1.43	14.5
0.90	0.13	1.3	1.90	0.46	4.6	2.89	0.78	8.0	3.89	1.11	11.3	4.88	1.43	14.6
0.92	0.14	1.4	1.91	0.46	4.7	2.91	0.79	8.0	3.91	1.11	11.4	4.90	1.44	14.7
0.94	0.14	1.5	1.93	0.47	4.8	2.93	0.79	8.1	3.93	1.12	11.4	4.92	1.45	14.7
0.96	0.15	1.5	1.95	0.48	4.8	2.95	0.80	8.2	3.95	1.13	11.5	4.94	1.45	14.8
0.98	0.16	1.6	1.97	0.48	4.9	2.97	0.81	8.2	3.97	1.13	11.5	4.96	1.46	14.9
												4.98	1.47	14.9

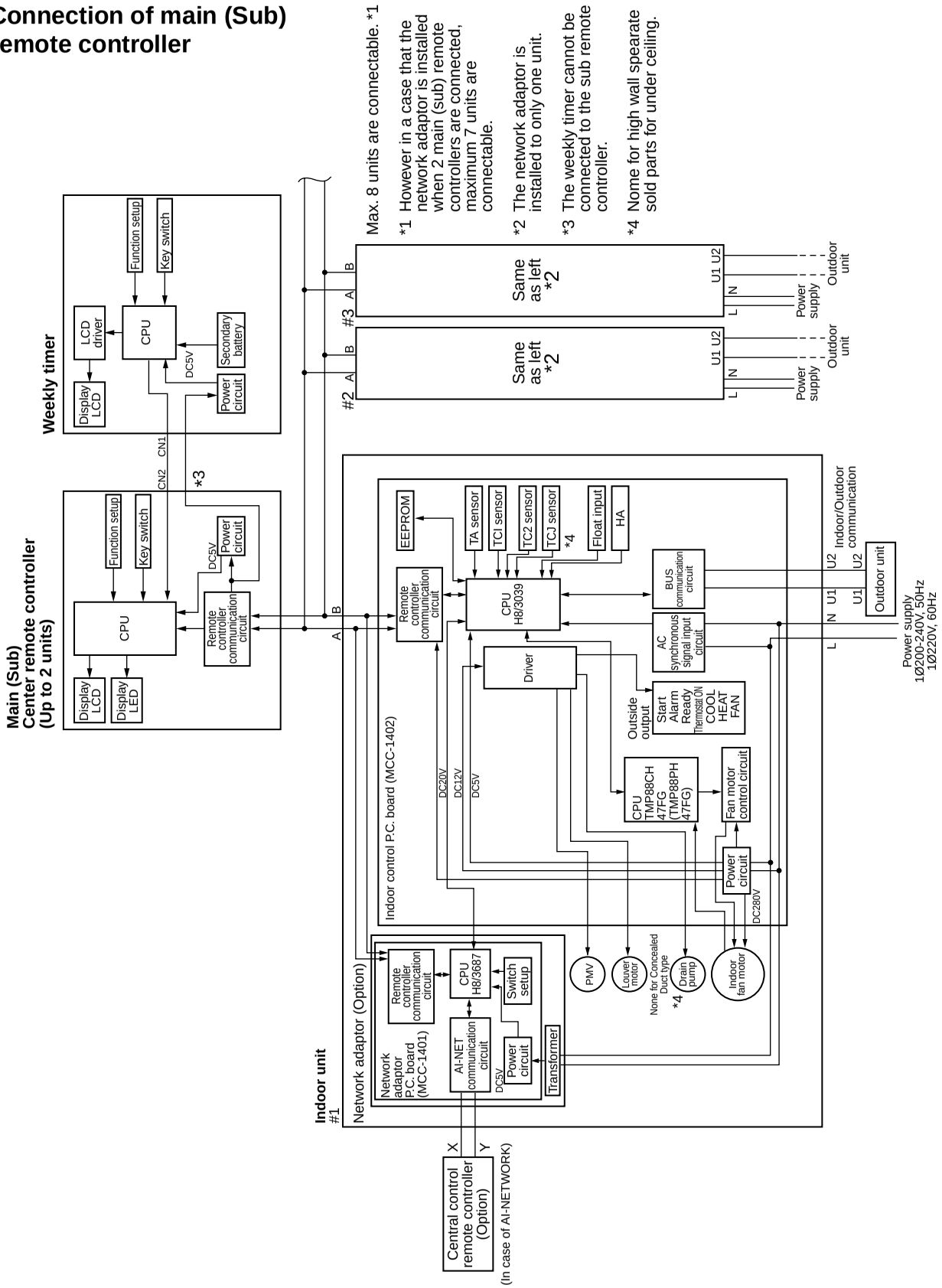
10. CONFIGURATION OF CONTROL CIRCUIT

10-1. Indoor Unit

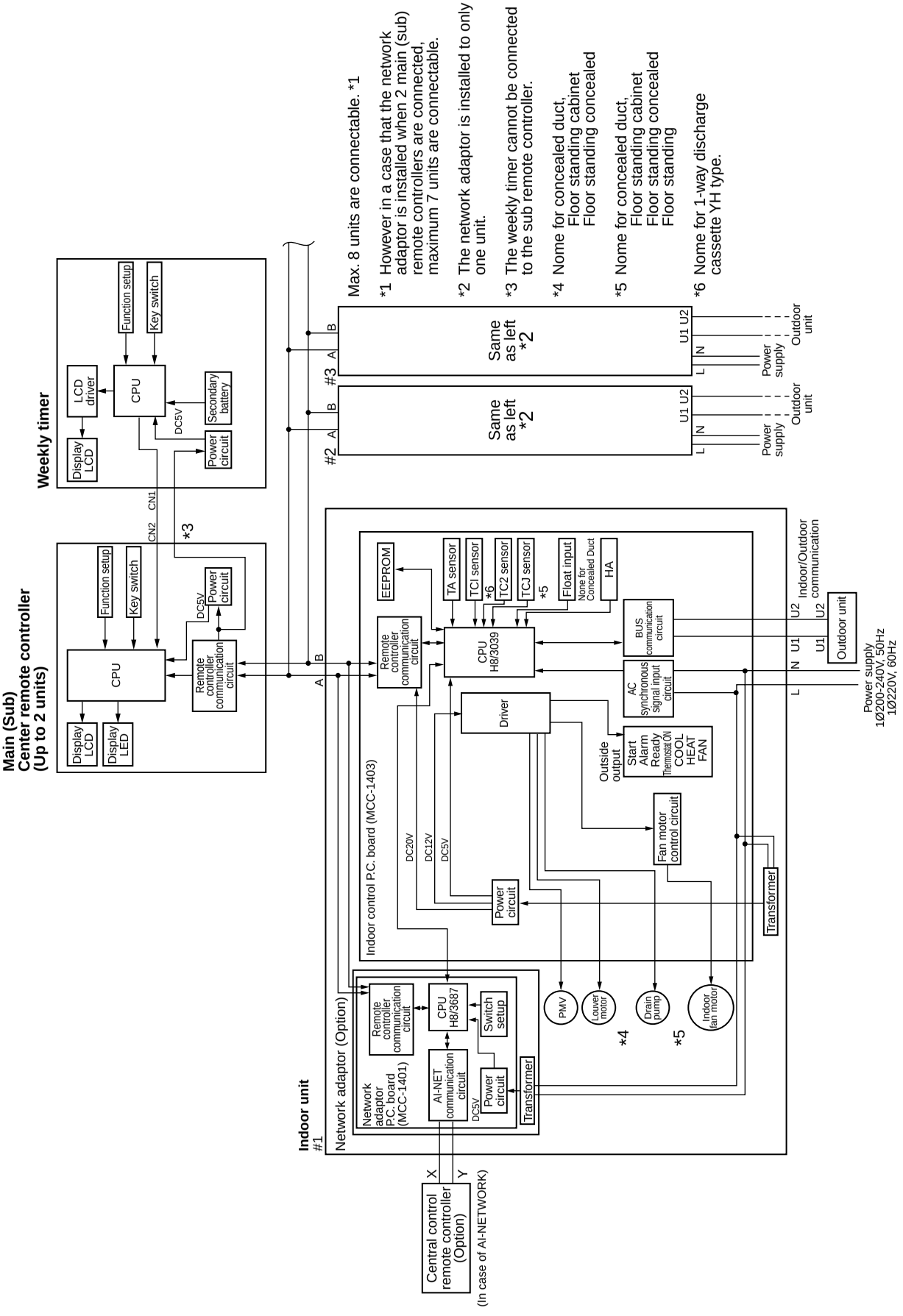
10-1-1. Indoor Controller Block Diagram

<4-way Air Discharge Cassette Type, Concealed Duct Standard Type, Under Ceiling Type, High Wall Type>

1. Connection of main (Sub) remote controller

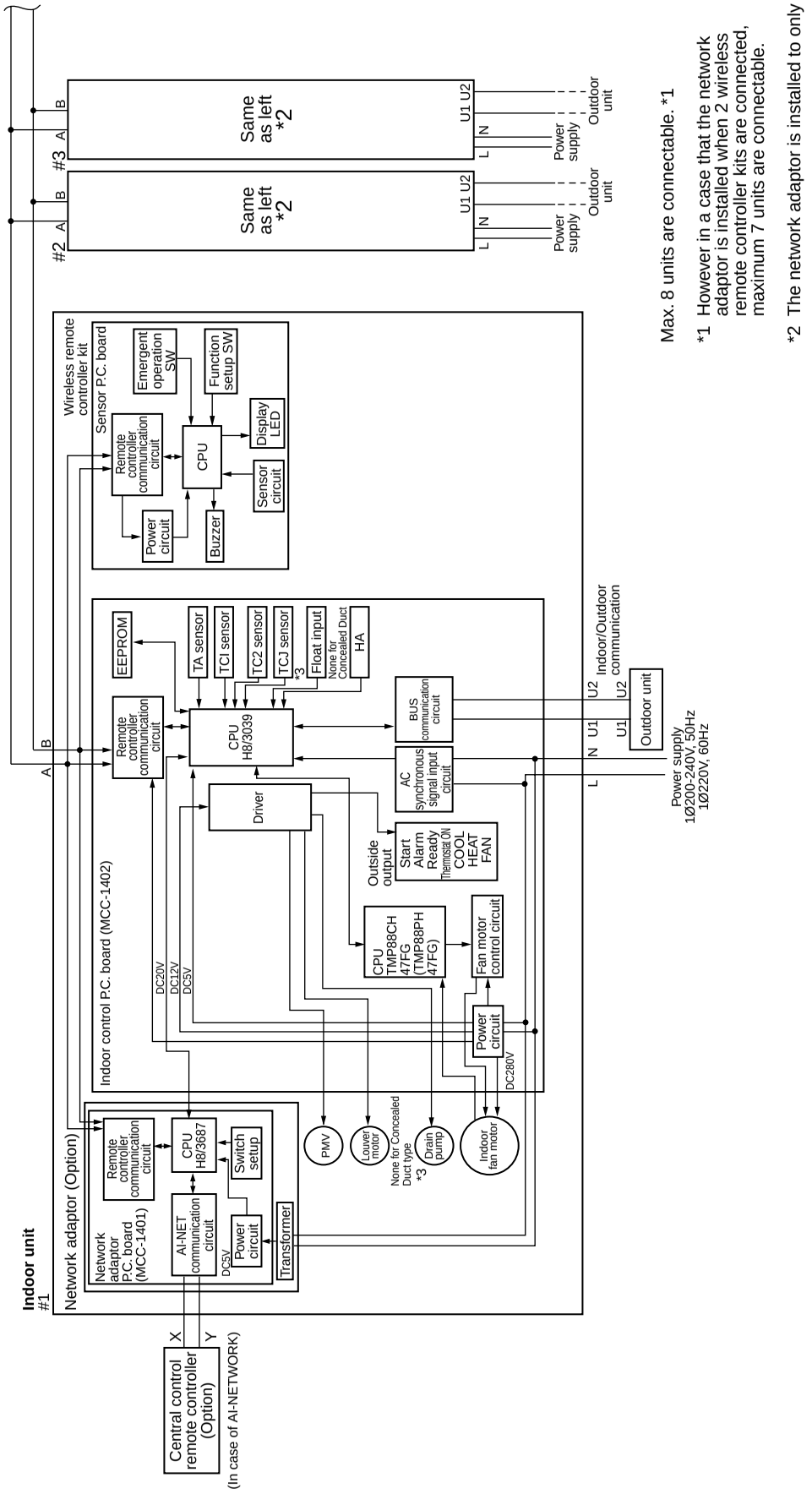


<2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type, Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type>



2. Connection of wireless remote controller kit

<4-way Air Discharge Cassette Type, Concealed Duct Standard Type, Under Ceiling Type, High Wall Type>



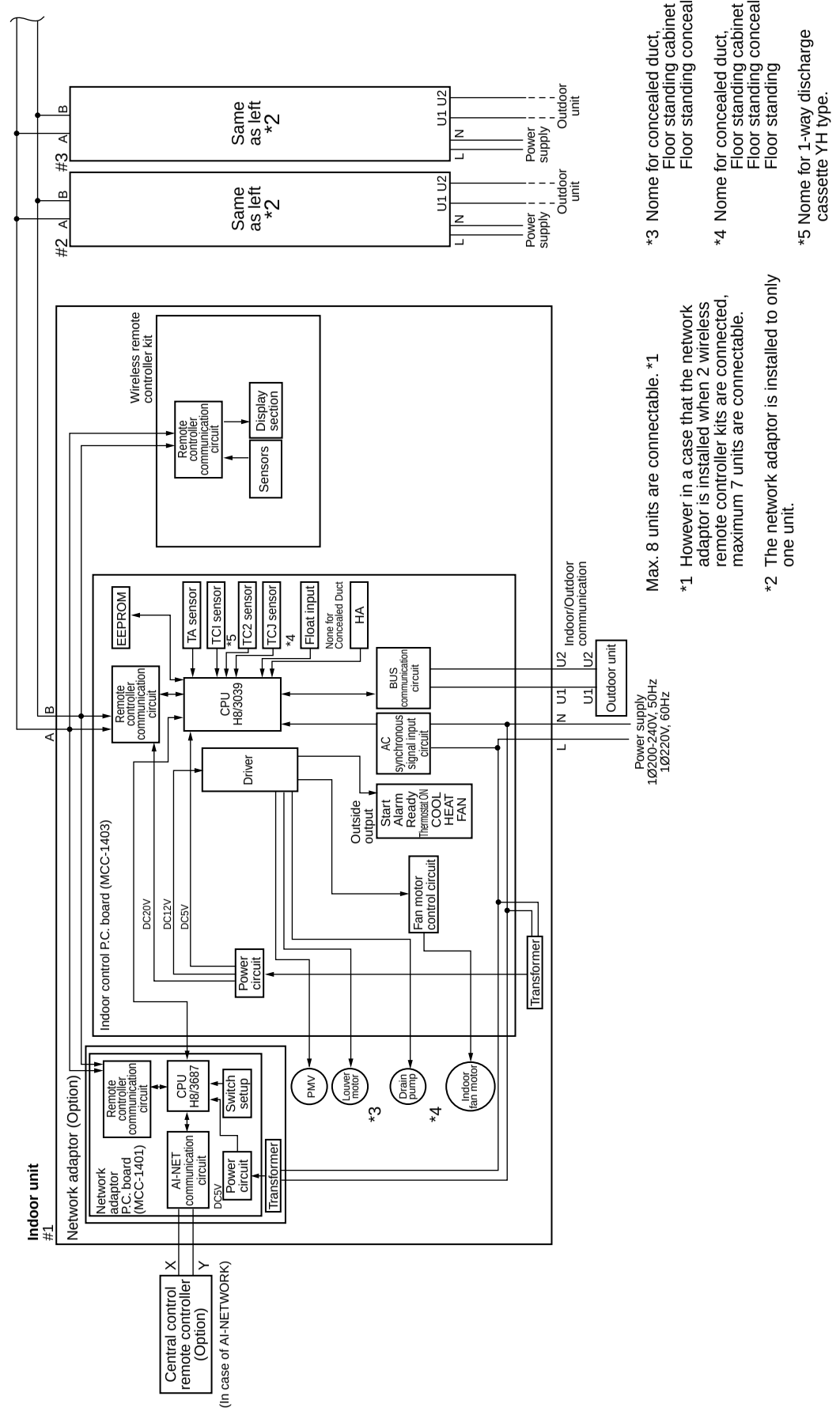
Max. 8 units are connectable. *1

*1 However in a case that the network adaptor is installed when 2 wireless remote controller kits are connected, maximum 7 units are connectable.

*2 The network adaptor is installed to only

*3 Nome for high wall spearate sold parts for under ceiling. one unit.

<2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type, Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type>



Max. 8 units are connectable. *1

*1 However in a case that the network adaptor is installed when 2 wireless remote controller kits are connected, maximum 7 units are connectable.

*2 The network adaptor is installed to only one unit.

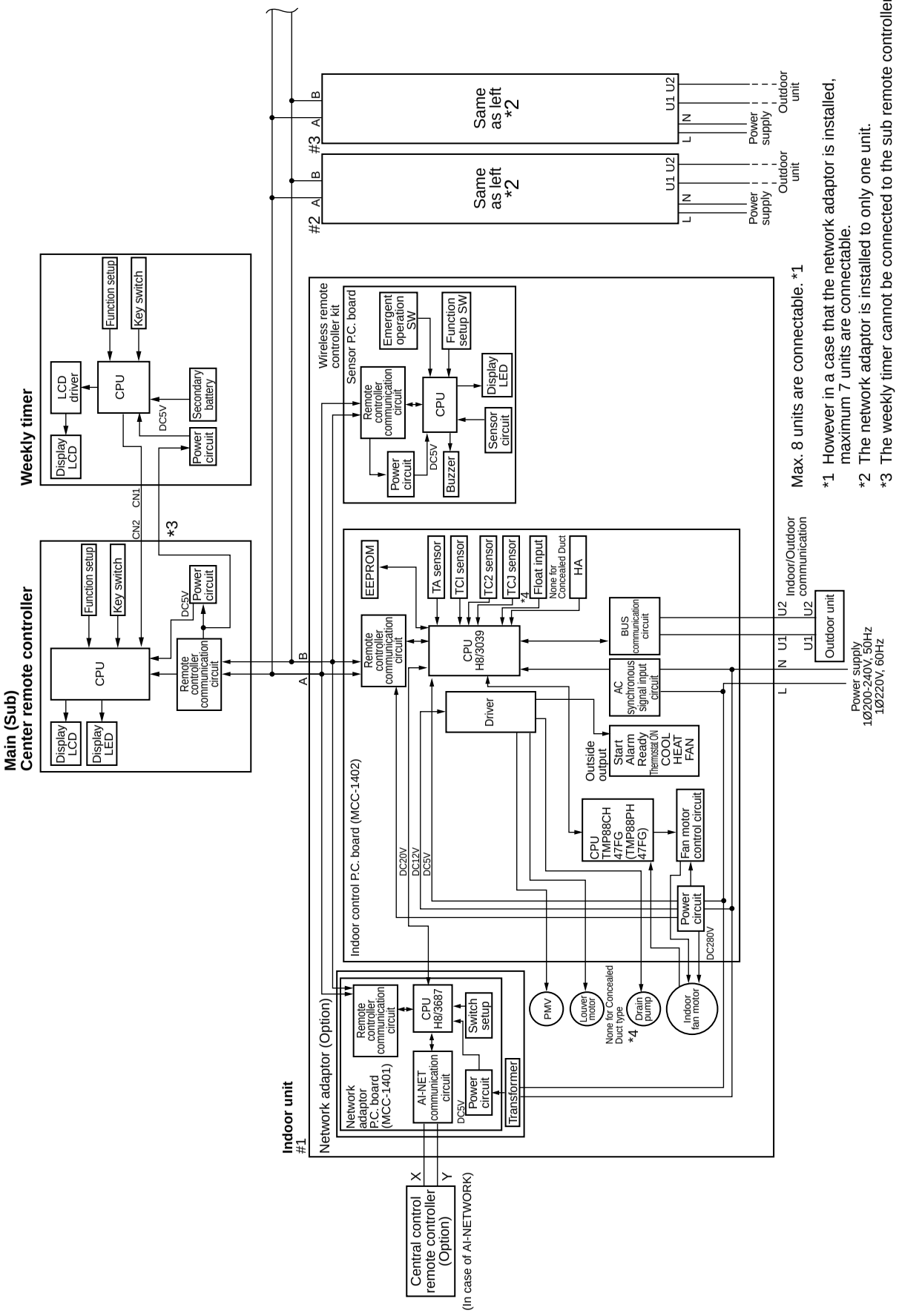
*3 Nome for concealed duct,
Floor standing cabinet
Floor standing concealed

*4 Nome for concealed duct,
Floor standing cabinet
Floor standing concealed
Floor standing

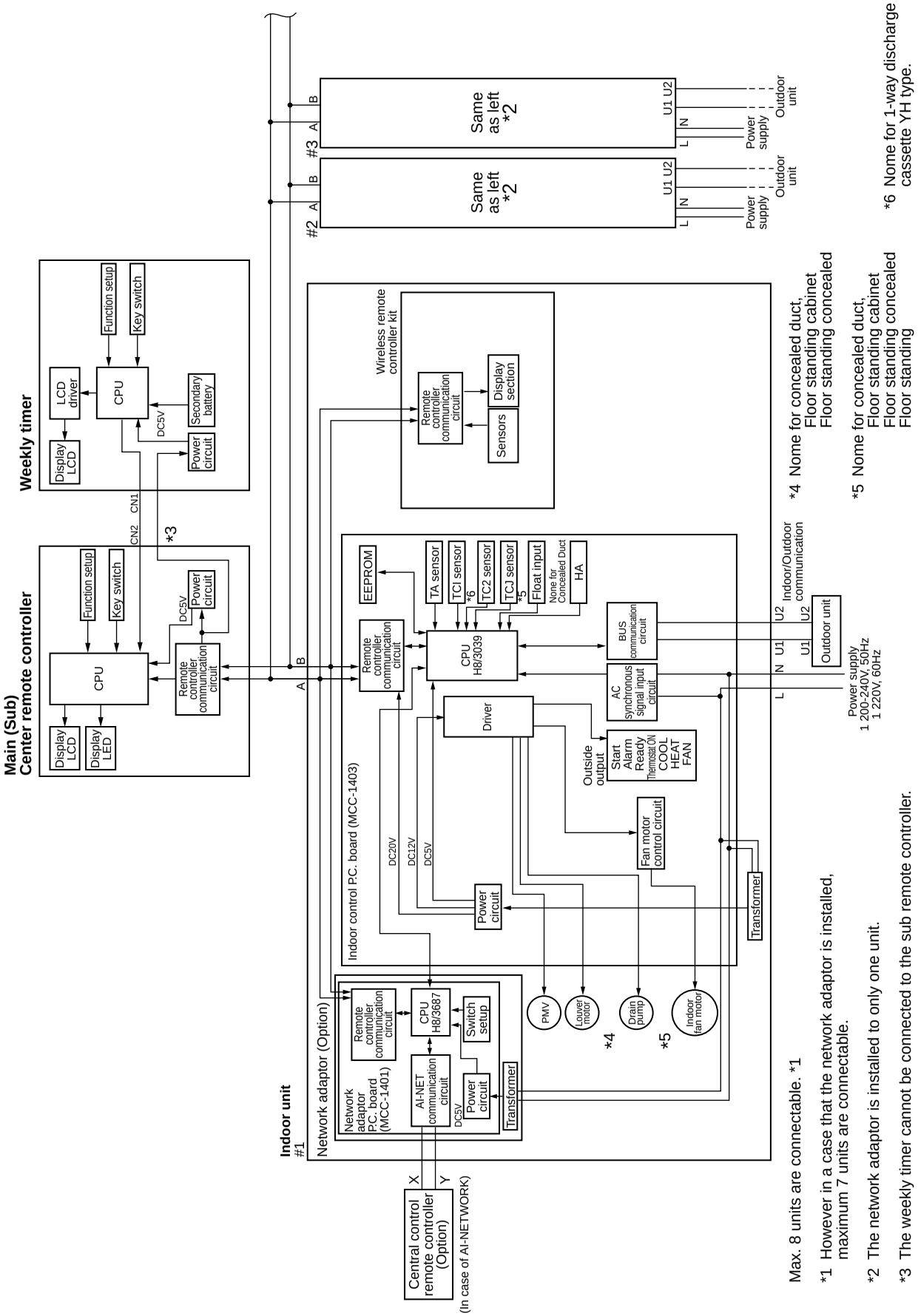
*5 Nome for 1-way discharge cassette YH type.

3. Connection of both main (sub) remote controller and wireless remote controller kit

<4-way Air Discharge Cassette Type, Concealed Duct Standard Type, Under Ceiling Type, High Wall Type>



<2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type, Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type>



Max. 8 units are connectable. *1

*1 However in a case that the network adaptor is installed, maximum 7 units are connectable.

*2 The network adaptor is installed to only one unit.

*3 The weekly timer cannot be connected to the sub remote controller.

*4 Nome for concealed duct, Floor standing cabinet Floor standing concealed

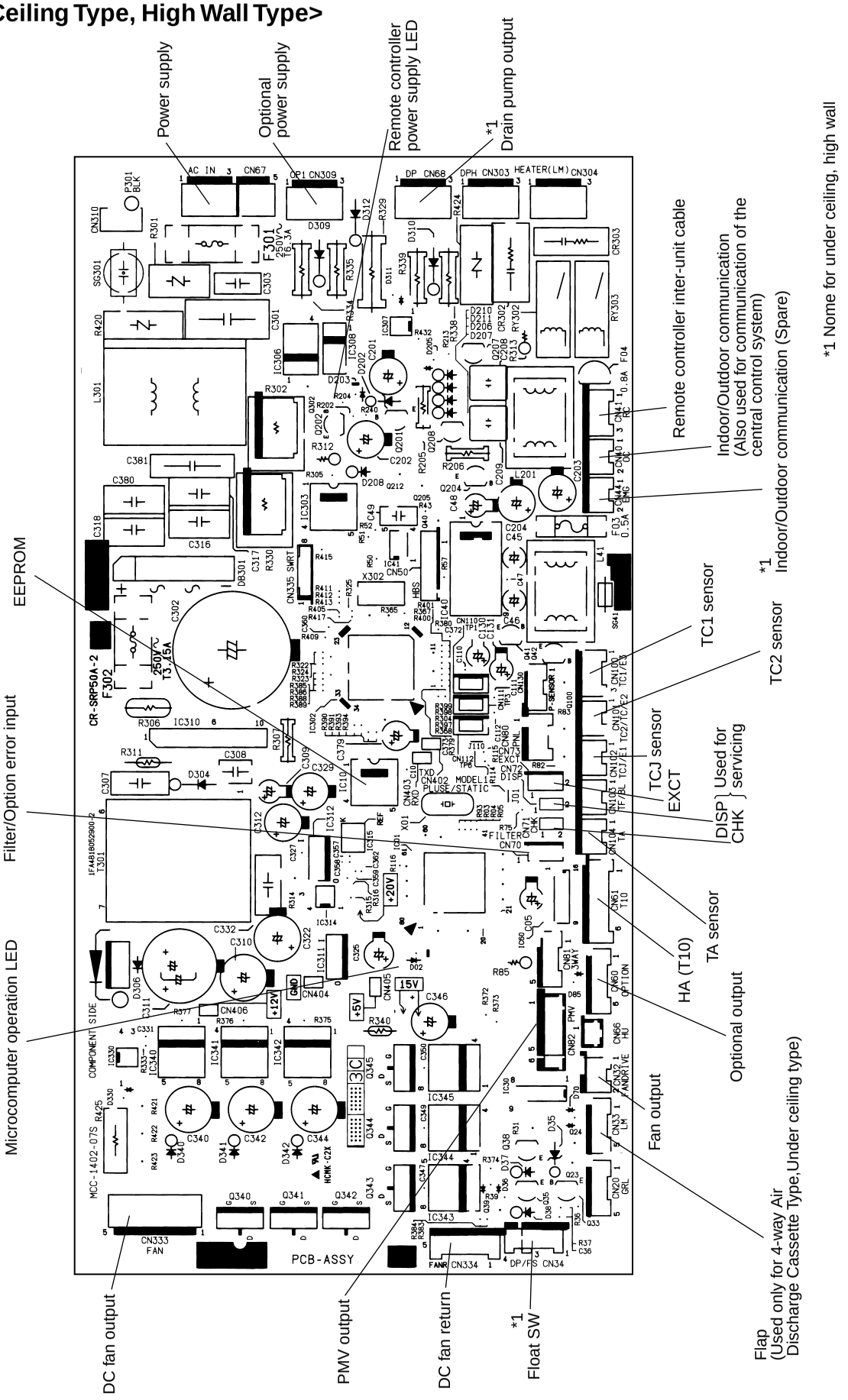
*5 Nome for concealed duct, Floor standing cabinet Floor standing concealed Floor standing

*6 Nome for 1-way discharge cassette YH type.

10-1-2. Indoor Print Circuit Board

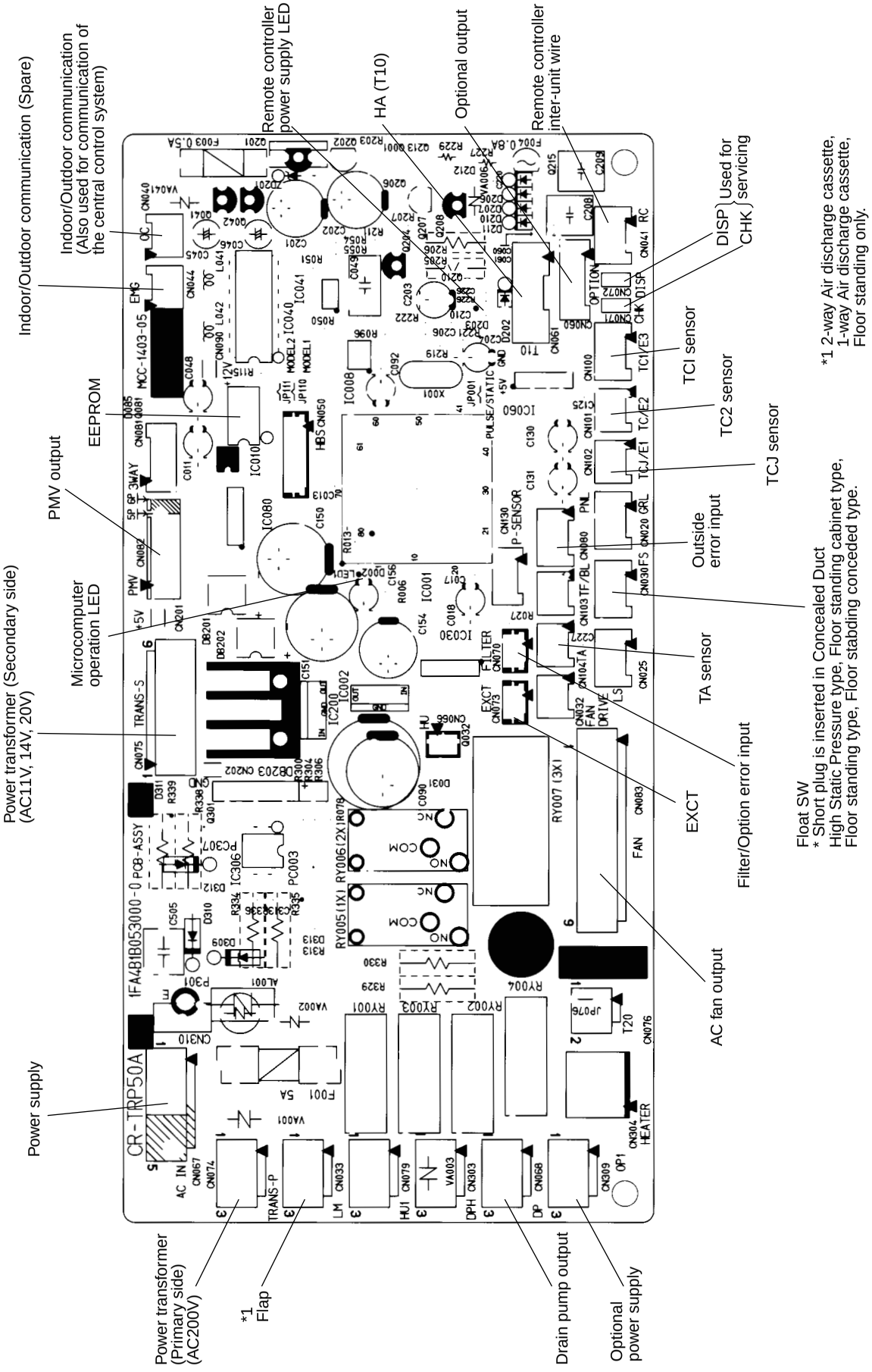
MCC-1402

<4-way Air Discharge Cassette Type, Concealed Duct Standard Type, Under Ceiling Type, High Wall Type>

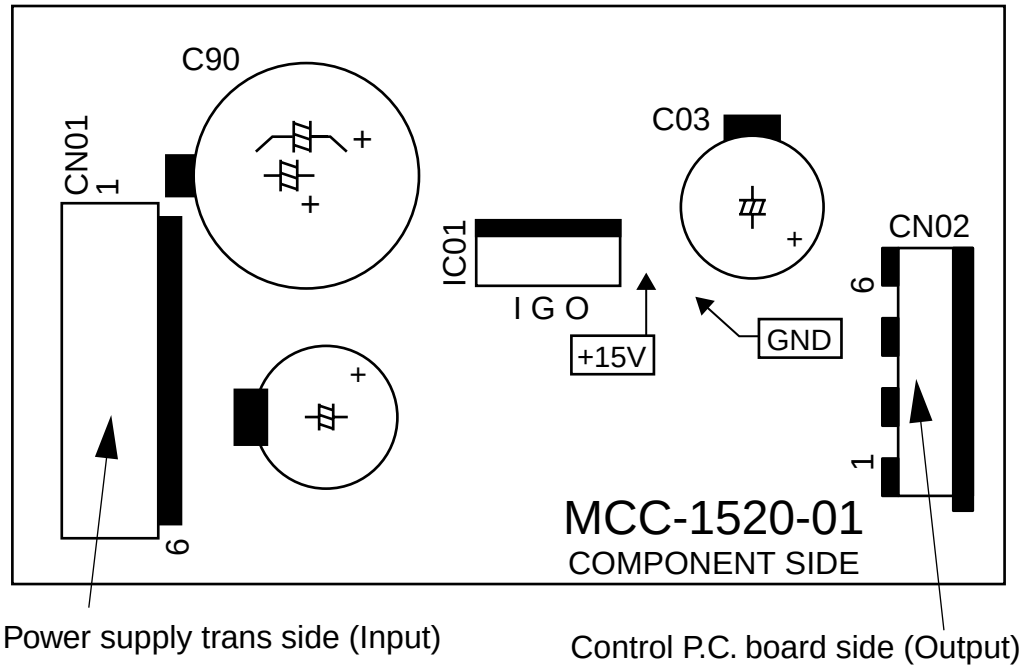


MCC-1403

<2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type, Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type>



MCC-1520
<2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type, Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type>

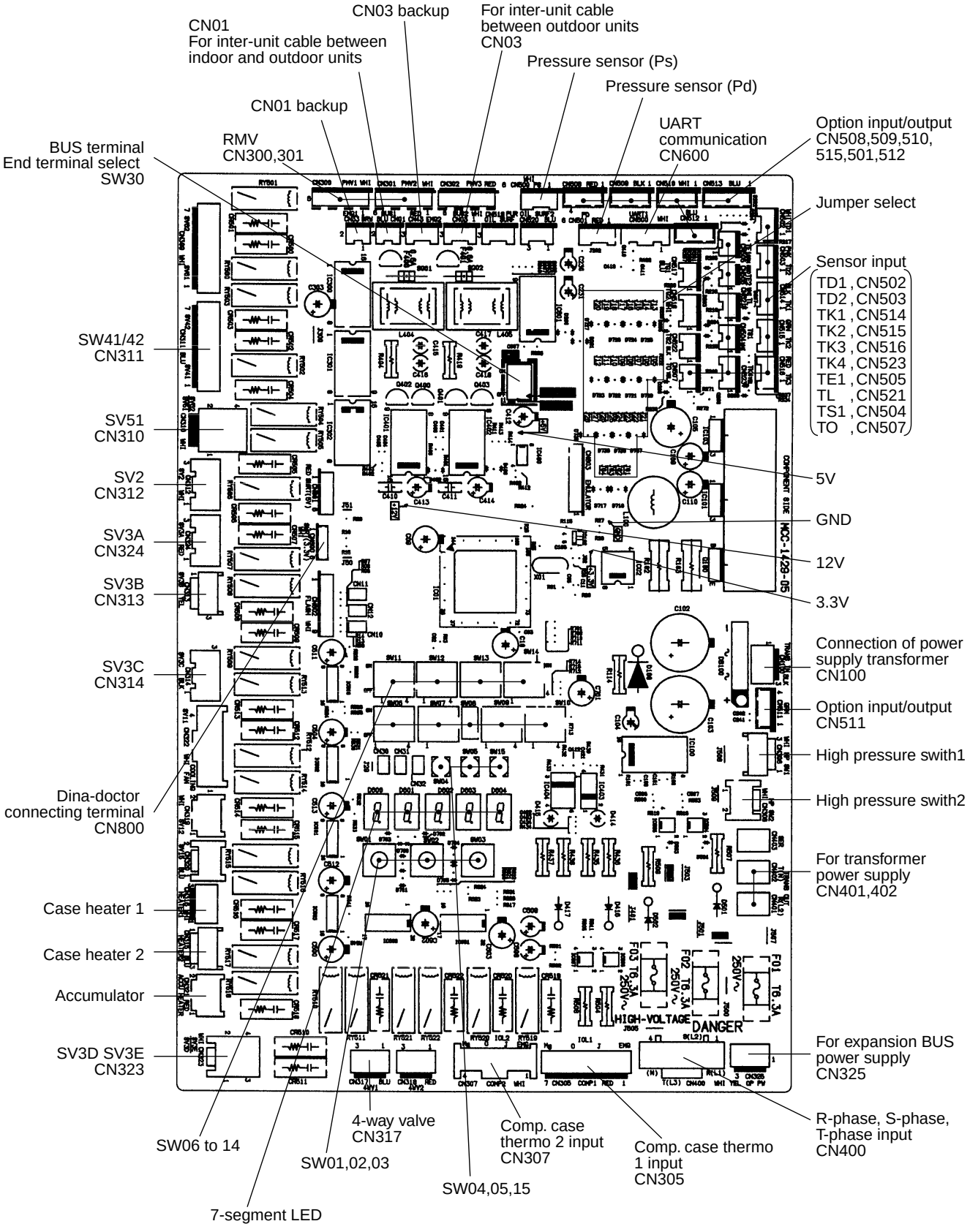


10-1-3. Optional Connector Specifications of Indoor P.C. Board

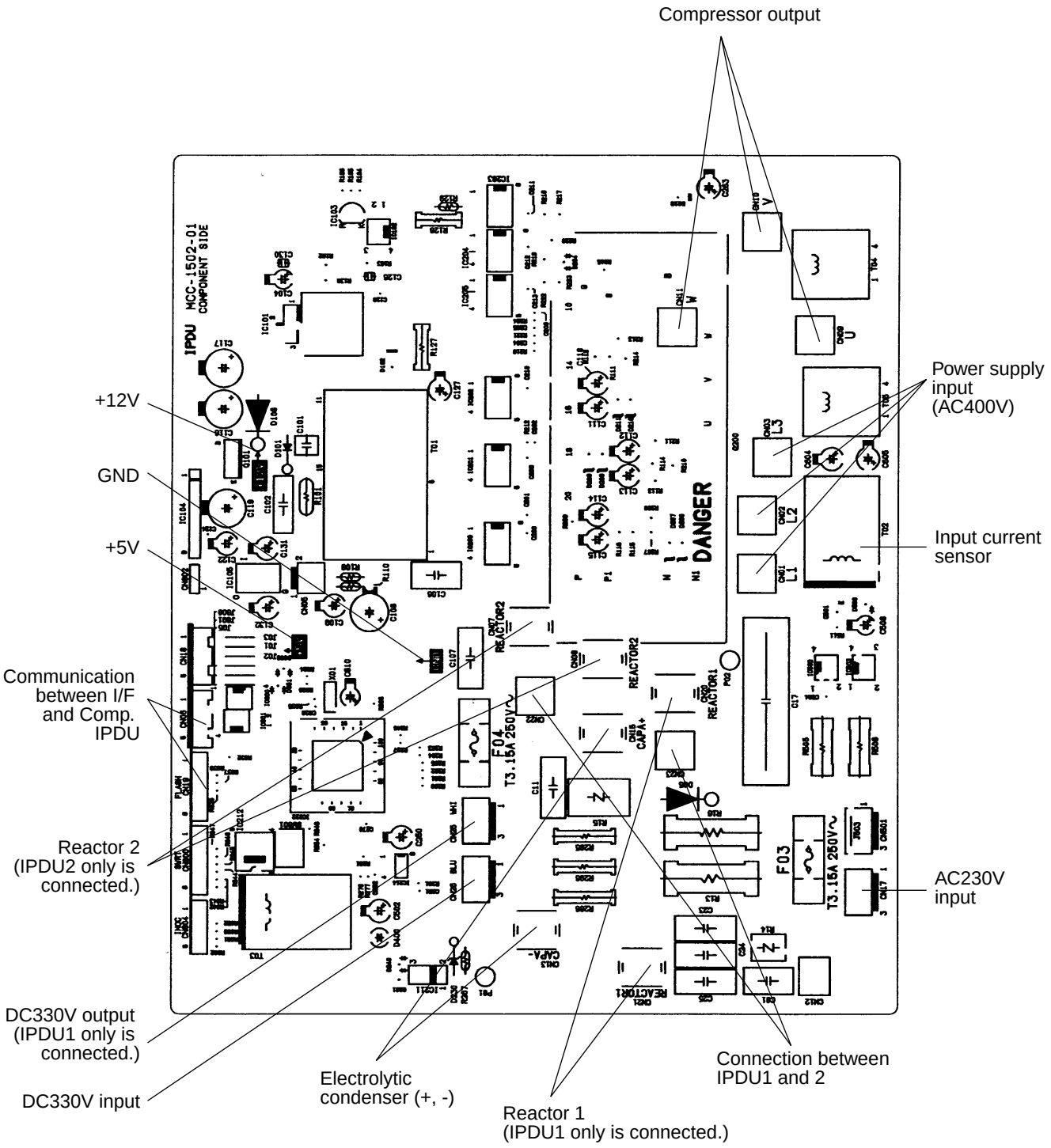
Function	Connector No.	Pin No.	Specifications	Remarks
Humidifier output	CN66	①	DC12V	In heating, thermo ON, Fan ON, Humidifier output ON * Humidifier provided, Drain pump ON is set up by CN70 short-circuit or from remote controller. (DN=40)
		②	Output	
Fan output	CN32	①	DC12V	Shipment setup: ON with indoor unit operation and OFF with stop are linked. * Single operation by FAN button on remote controller is set up from remote controller (DN=31)
		②	Output	
—	CN61	①	ON/OFF input	HA ON/OFF input (J01: YES/NO=Pulse (At shipment) / Static input select)
		②	0V (COM)	
		③	Main prohibition input	Operation stop of main remote controller is permitted / prohibited by input.
		④	Operation output	ON during operation (Answerback of HA)
		⑤	DC12V (COM)	
		⑥	Alarm output	ON during alarm output
Option output	CN60	①	DC12V (COM)	
		②	Defrost output	ON when outdoor unit is defrosted
		③	Thermo ON output	ON during Real thermostat ON (Compressor ON)
		④	COOL output	ON when operation mode is cooling system (COOL, DRY, Cool/Heat Auto cooling)
		⑤	HEAT output	ON when operation mode is heating system (HEAT, Cool/Heat Auto cooling)
		⑥	Fan output	ON when indoor fan is ON (During use of air cleaner/Interlock cabling)
Outside error input	CN80	①	DC12V (COM)	Generate check code “L30” (for 1 minute continuously) to stop forcedly the operation.
		②	DC12V (COM)	
		③	Outside error input	
—	CN20	—	—	—
—	CN70	—	—	—
CHK operation check	CN71	①	Check mode input	Used for indoor operation check. (Outdoor does not communicate with remote controller, and outputs specified operation such as indoor fan “H”, drain pump ON, etc.)
		②	0V	
DISP exhibition mode	CN72	①	Display mode input	Exhibition mode enables to communicate by indoor unit and remote controller only. (When power has been turned on.) Timer short (Usual)
		②	0V	
EXCT demand	CN73	①	Demand input	Indoor unit forced thermostat OFF operation
		②	0V	

10-2. Outdoor unit

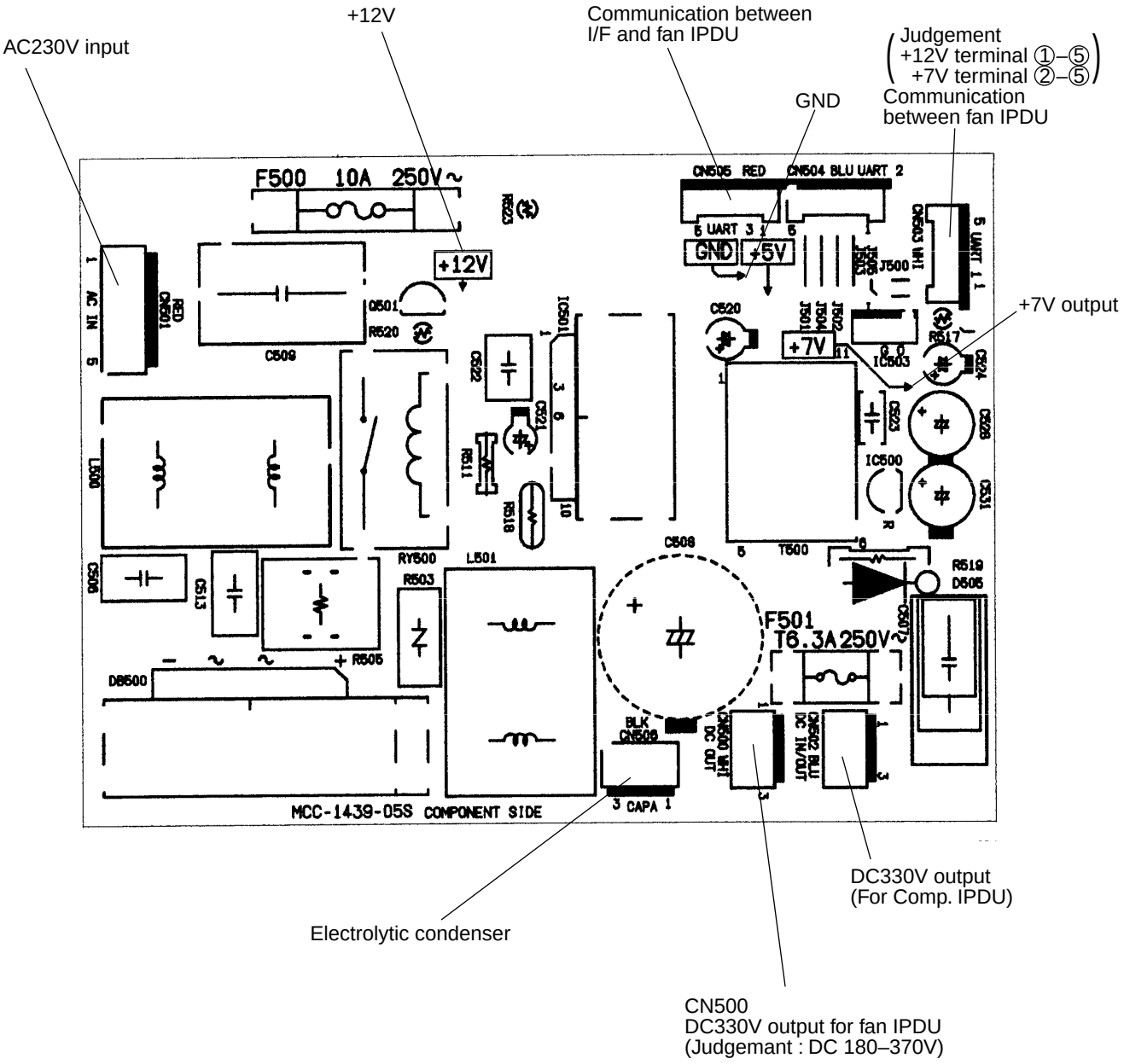
Positions to be checked on the interface P.C. board (MCC-1429)



Inverter P.C. board (MCC-1502)



Power P.C. board for fan (MCC-1439)



10-2-1. Outdoor Interface P.C. Board

<Dip switch function exchange setup list>

Part type		Exchange contents							Initial setup at shipment
SW01	Rotary SW 4bit 16 step	Display / Operation switch (1)					For 7-segment display / service operation		[1]
SW02	Rotary SW 4bit 16 step	Display / Operation switch (2)					For 7-segment display / service operation		[1]
SW03	Rotary SW 4bit 16 step	Display / Operation switch (3)					For 7-segment display / service operation		[1]
SW04	Push SW	For service [Operation/Start]					[Operation/Start] by pushing		—
SW05	Push SW	For service [Stop/End]					[Stop/End] by pushing		—
SW06	SW 4bit	Bit 1	Backup setup				(Based on the following setup)		OFF
		Bit 2		Bit 4	Bit 3	Bit 2	Bit 1		OFF
		Bit 3		OFF	OFF	OFF	OFF	Normal	OFF
		Bit 4		—	—	OFF	ON	No.1 COMP backup	OFF
				—	—	ON	OFF	No.2 COMP backup	
				—	—	ON	ON	Outdoor backup during cooling season	
SW07	SW 4bit	Bit 1	Demand control exchange					OFF: 0 – 100%, ON: Middle – 100%	OFF
		Bit 2	Extended control demand function					(For 4-steps exchange)	OFF
		Bit 3	For clean converter					OFF: Normal (unconnected), ON: Connected	OFF
		Bit 4	—					—	OFF
SW09	SW 4bit	■ Header unit							
		Bit 1	Outdoor address setup exchange					OFF: Auto setup (Normal), ON: Manual setup	OFF
		Bit 2	Judge indoor capacity over					OFF: YES (Normal), ON: NO	OFF
		Bit 3	Correction of installed pipe size					OFF: Normal, ON: Size UP (For outdoor expansion)	OFF
		Bit 4	Judge abnormal No. of connected indoor units					OFF: No error judgment, ON: Error	OFF
		■ Follower unit							
		Bit 1	—					—	OFF
		Bit 2	—					—	OFF
		Bit 3	—					—	OFF
		Bit 4	Display of start priority No.					OFF: Outdoor unit No. [U.#] (#: 2 to 4) ON : Outdoor start order No. [Y.#] (#: 2 to 4)	OFF
SW10	SW 4bit	Bit 1	—					—	OFF
		Bit 2	Outdoor fan high-static pressure operation					OFF : Normal, ON: High-static pressure operation	OFF
		Bit 3	For low-noise operation					OFF: Normal, ON : INV frequency upper limit restriction	OFF
		Bit 4						OFF: Normal, ON: Fan rpm upper limit restriction	OFF
SW11	SW 4bit	Bit 1	Set up priority of cool/heat					(Based on following setup)	OFF
		Bit 2				Bit 2	Bit 1		OFF
						OFF	OFF	Priority on heating	
						OFF	ON	Priority on cooling	
						ON	OFF	Priority on No. of operating units	
						ON	ON	Priority on specific indoor unit	
		Bit 3						—	OFF
		Bit 4	Operation when indoor overflow detected					OFF: System stop, ON : System operation continues	OFF
SW12	SW 4bit	Bit 1	—					—	OFF
		Bit 2	—					—	OFF
		Bit 3	—					—	OFF
		Bit 4	—					—	OFF
SW13	SW 4bit	Bit 1	—					—	OFF
		Bit 2	—					—	OFF
		Bit 3	—					—	OFF
		Bit 4	Line address setup						OFF
SW14	SW 4bit	Bit 1, 2, 3, 4		Line address setup				Refer to item “Address setup procedure”	OFF
SW30	SW 2bit	Bit 1	End terminal resistance of communication between outdoor units					OFF: No end terminal resistance, ON: Exists	ON
		Bit 2						OFF: No end terminal resistance, ON: Exists	ON
CN30	Check connector	Manual full opening setup of PMV						Opened: Normal, Short: Opened fully	Open
CN31	Check connector	Manual full closing setup of PMV						Opened: Normal, Short: Opened fully	Open
CN32	Check connector	Check for assembly line in factory.						Opened: Normal, Short: Check mode	Open

* The outdoor unit connected with indoor/outdoor communication line becomes automatically the header unit. The setup is unnecessary to be manually changed.

11. BACKUP OPERATIONS (EMERGENCY OPERATION)

When a trouble occurred at an outdoor unit or at one of the compressors in outdoor unit, the troubled unit or troubled compressor stops and a backup operation (emergency operation) is available by other outdoor units and the compressors. Set up a backup operation following to the procedure below.

11-1. Before Backup Operation

Method of the backup operation differs by the contents of the trouble. Refer to the following table.

Trouble contents	Backup operation method	Setup procedure
When a trouble occurred on one of the compressors in the same unit (Note 1)	Compressor backup	To item 2
When troubles occurred on the both compressors in the same unit	Outdoor unit backup or outdoor unit backup during cooling season (Note 2)	To item 3 or item 4
Trouble of compressor coil (Such as defect of compressor coil)		
When a trouble occurred on refrigerating system parts, fan system parts, or electric system parts		
When a trouble occurred on temperature sensor or pressure sensor		

(Note 1) When a trouble of compressor coil, etc occurred, deterioration of the oil is heavy. Therefore do not perform a backup operation; otherwise a trouble of the other outdoor units may be caused.

(Note 2) The outdoor unit to be processed with a backup operation should be restricted to one unit in the system of 1 system.

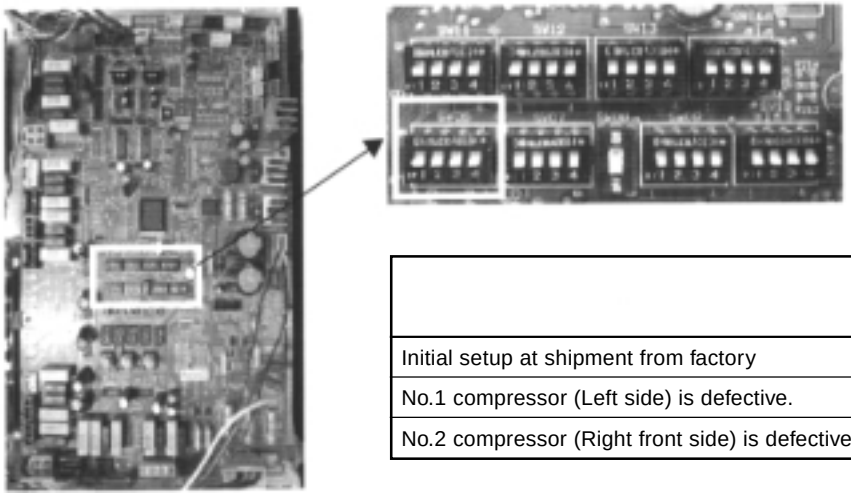
11-2. Compressor Backup Setup

<Outline>

When a trouble occurred on one of the two compressors, follow the procedure below if it is necessary to perform a backup operation by the other normal compressor.

<Work procedure>

1. Turn off the main power supplies of all the units connected to the system.
2. Set up the switch SW06 on the interface P.C. board of the outdoor unit with failure compressor as shown below.



	SW06			
	Bit 1	Bit 2	Bit 3	Bit 4
Initial setup at shipment from factory	OFF	OFF	OFF	OFF
No.1 compressor (Left side) is defective.	ON	OFF	OFF	OFF
No.2 compressor (Right front side) is defective.	OFF	ON	OFF	OFF

3. Turn on the main power supplies of all the units connected to the system.

Then setup operation for the compressor backup finishes.

11-3. Outdoor Unit Backup Setup

<Outline>

Against a case that a trouble occurs on the outdoor unit, backup operation can be set up to either header unit or follower unit. For the multiple outdoor unit system (Failure of compressor coil), perform an outdoor unit backup operation if the following error modes occurred.

- Trouble on compressor
- Trouble on pressure sensor (Pd, Ps) /temperature sensor (TD1, TD2, TS1, TE1, TK1, TK2, TK3, TK4, TL)

Note: Backup of the outdoor unit should be restricted to one unit in one system.

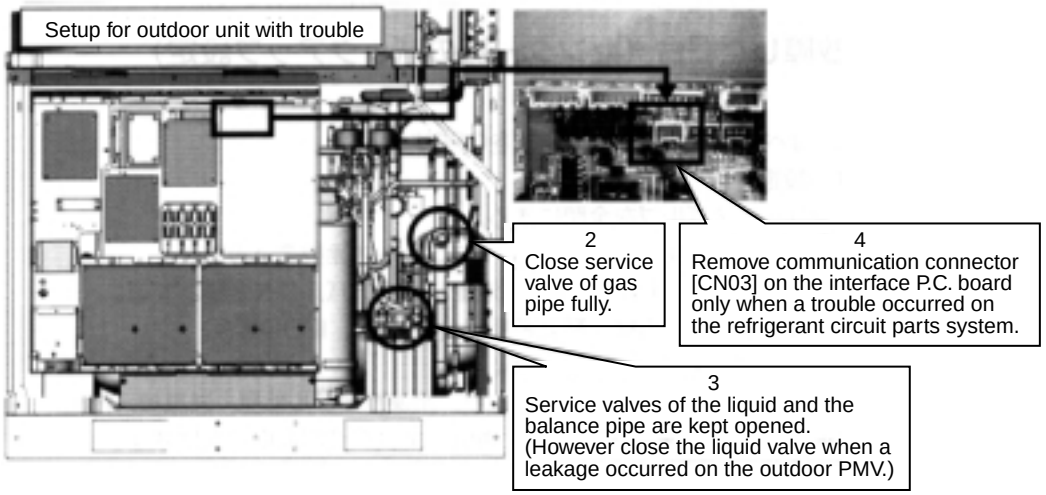
11-3-1. In case of Trouble on Follower Outdoor Unit (Backup setup for follower outdoor unit)

<Work procedure>

1. Turn off the main power supplies of all the units connected to the system.

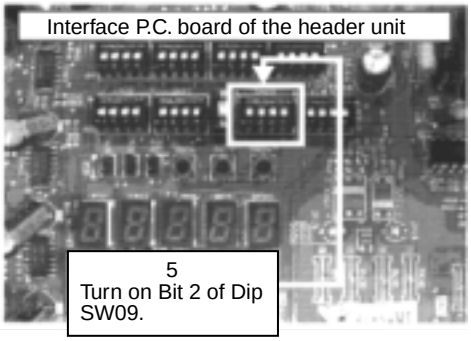
[Setup for outdoor unit with trouble]

2. Close fully the gas side service valve of the unit with trouble.
3. Leave service valve of the balance pipe of the liquid pipe opened. (To prevent refrigerant stagnation in the unit)
   However close fully service valve of the liquid pipe when there is PMC leakage in outdoor unit (PMV does not close.).
4. <In case of trouble on the compressor or electric parts system (Compressor, electric system parts, I/F P.C. board, IPDU P.C. board)>
   After then, keep OFF for the main power supply of the unit with trouble.
   <In case of trouble on the refrigerant circuit parts system (Pressure sensor, temperature sensor, refrigerat circuit parts, fan system parts)>
   Remove the communication (BUS2) connector [CN03] between outdoor units on the interface P.C. board.



[Setup for header unit]

5. Turn on Bit 2 of the Dip SW09 on the interface P.C. board of the header unit.
   (Setup not to detect the indoor capacity over)

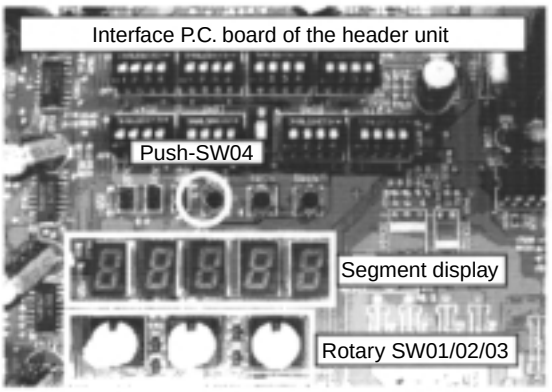


6. Turn on the power supplies of all the units other than the unit with trouble.
   As for power supply of the unit with trouble, follow the procedure below.
   <In case of trouble on the compressor or electric parts system (Compressor, electric system parts, I/F P.C. board, IPDU P.C. board)> Keep OFF for the main power supply of the unit.
   <In case of trouble on the refrigerant circuit parts system (Pressure sensor, temperature sensor, refrigerant circuit parts, fan system parts> Turn on the power supply to protect the compressor. (Case heater ON)
   (Although [E19] (Outdoor header unit quantity error) is displayed on 7-segment display after turning on the power supply of the unit, it is not a problem because it is only interruption of communication with the header unit.)

[Setup for the header unit]

7. Error clear is set up from the header unit.
   1) Check [U1] [E26] (Decrease of No. of connected outdoor units) is displayed on 7-segment display under condition that the rotary switches SW01/02/03 are set to 1/1/1 on the interface P.C. board.
   2) Set the rotary switches SW01/02/03 on the interface P.C. board to 2/16/1, and then push the push SW04 for 5 seconds or more after [Er] [ ] have been displayed on 7-segment display.
   3) [Er] [CL] are displayed on 7-segment display. (Error clear completes.)
   4) Return SW01/02/03 to 1/1/1. (It is normal if [U1] [– – –] are displayed.)

7
Set rotary SW01/02/03 to 1/1/1.
[U1] [E26] are displayed.
↓
Set rotary SW01/02/03 to 2/16/1.
[Er] [ ] are displayed.
↓
Push the push-SW04 for 5 seconds or more.
[Er] [CL] are displayed.
↓
Return rotary SW01/02/03 to 1/1/1.
[U1] [– – –] are displayed.



All the backup setup for the header unit has completed. Check the operation.

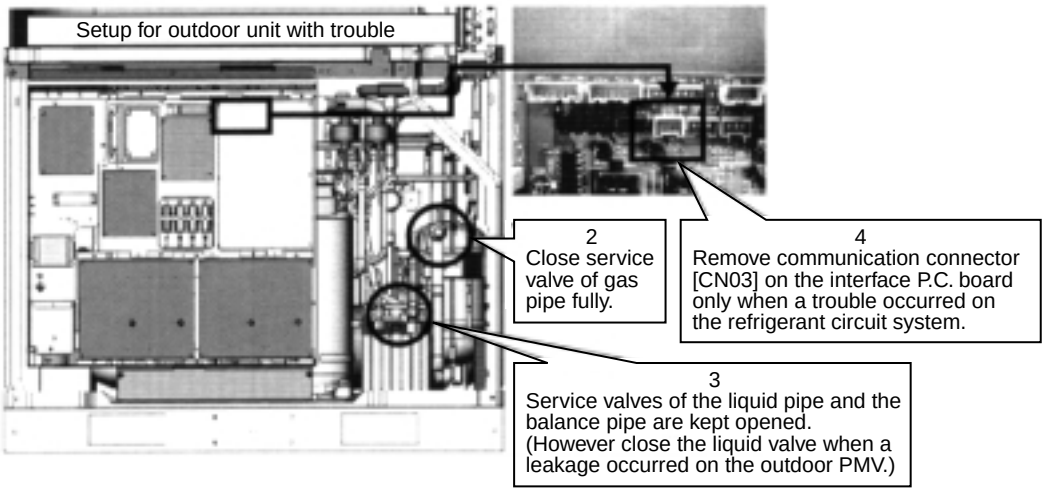
11-3-2. In Case of Trouble on Header Unit (Backup setup for header unit)

<Work procedure>

1. Turn off the main power supplies of all the units connected to the system.

[Setup for outdoor unit with trouble]

2. Close fully the gas side service valve of the unit with trouble.
3. Leave service valve of the balance pipe and the liquid pipe fully opened. (To prevent refrigerant stagnation in the unit)
   However close fully service valve of the liquid pipe when there is PMV leakage in outdoor unit
   (When PMV can not be closed fully)
4. <In case of trouble on the compressor or electric parts system (Compressor, electric system parts, I/F P.C. board, IPDU P.C. board)>
   After then, keep OFF for the main power supply of the unit with trouble.
   <In case of trouble on the cycle parts system (Pressure sensor, temperature sensor, refrigerat circuit parts, fan system parts)>
   Remove the communication (Refrigerant circuit) connector [CN03] between outdoor units on the interface P.C. board.

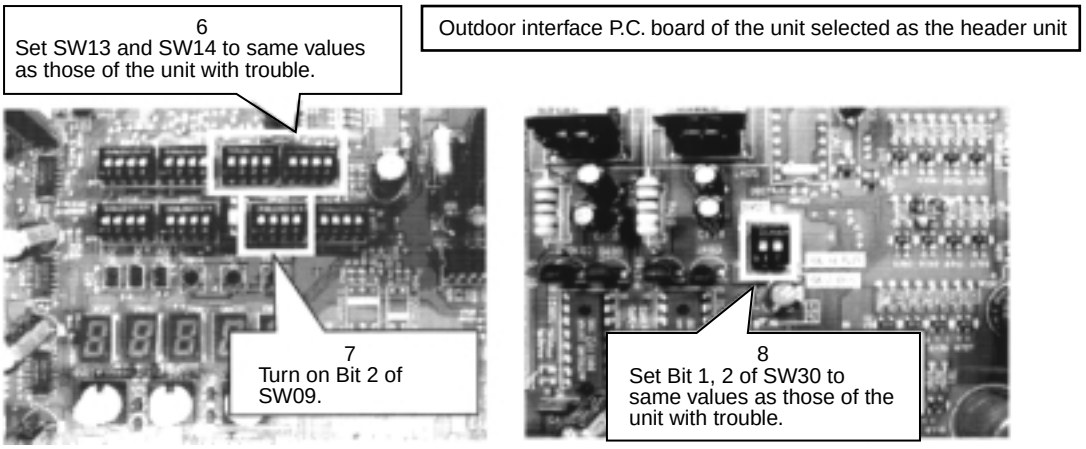


[Selection of header unit]

5. Select a header unit among the follower units based upon the following criteria.
   - If only one follower unit is connected, select it as the header unit.
   - When two or more follower units are connected, select an outdoor unit nearest to the header unit as the header unit.

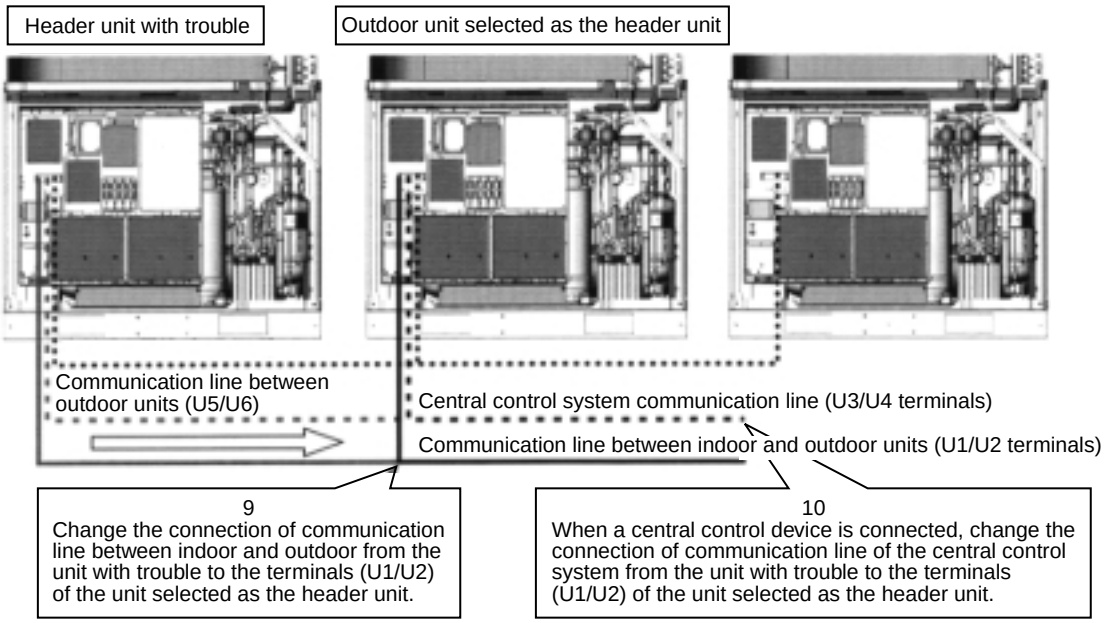
[Setup for the unit selected as the header unit]

6. Match the setup of SW13 and SW14 on the interface P.C. board with SW setup of the unit with trouble. (Refrigerant system address setup)
7. Turn on Bit 2 of SW09 on the interface P.C. board. (Setup not to detect the indoor capacity over)
8. Match the setup of SW30 Bit 1 and 2 on the interface P.C. board with SW setup of the unit with trouble. (Setup for end terminal resistance of communication)



[Connection change of the communication line]

9. Change the communication line between outdoor and indoor from [U1, U2] terminal of the header unit with trouble to [U1/U2] of the unit selected as the header unit.
10. If a central control device is connected, connect the communication line [U3/U4] of the central control system to the communication line [U3/U4] terminal of the unit selected as the header unit, and connect a relay connector between [U1/U2] and [U3/U4] terminals.



11. Turn on the power supplies of each outdoor unit.

    Turn on the main power supplies of all the units other than the unit with trouble. As for power supply of the unit with trouble, follow the procedure below.

    Leave the main power supply of the unit with trouble as it is.

    <In case of trouble on the compressor or electric parts system (Compressor, electric system parts, I/F P.C. board, IPDU P.C. board)> Keep OFF for the main power supply of the unit.

    < In case of trouble on the refrigerant circuit parts system (Pressure sensor, temperature sensor, refrigerat circuit parts, fan system parts)> Turn on the main power supply to protect the compressor. (Case heater ON) (Although [E19] (Outdoor header unit quantity error) is displayed on 7-segment display after turning on the power supply of the unit, it is not a problem because it is only interruption of communication with the header unit.)

Then all the backup setup for the header unit has finished. Check the operation.

11-4. Backup Setup for Outdoor Unit during Cooling Season

<Outline>

Restricted to a case unnecessary to operate the air system in HEAT mode in cooling season, etc, this function enables the backup operation to operate quickly by omitting various setups even when the header unit or follower unit has mal-functioned.

This backup operation is same as that of the abovementioned “Outdoor Unit Backup Setup” except that it cannot operate in HEAT mode.

Note 1) When this function is set up, a heating operation is unavailable.
(HEAT mode cannot be selected on the remote controller.)

Note 2) If a trouble occurred on the interface P.C. board or the electric cycle system, the backup operation cannot be performed by this setup. In this case, execute the abovementioned “Outdoor Unit Backup Setup”.

<Work procedure>

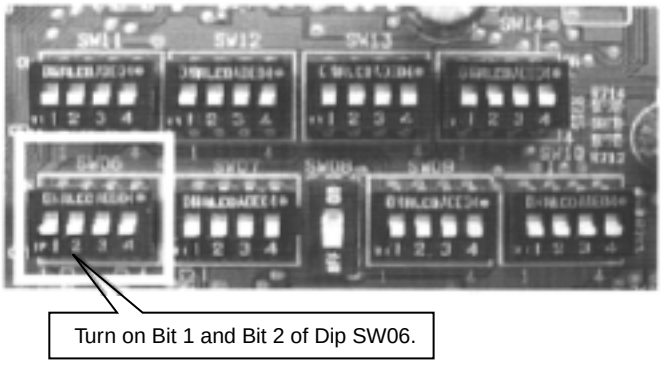
1. Turn off the main power supplies of all the units connected to the system.

[Setup for outdoor unit with trouble]

(The following procedure is common even if the outdoor unit with trouble is the header or follower unit.)

2. Turn on both Bit 1 and 2 of the SW06 on the interface P.C. board.
3. Close fully the service valve of the liquid pipe when there is leakage of outdoor PMV (PMV does not close.).
4. Turn on the main power supplies of all the units connected to the system.
   If the trouble is a compressor insulation error and others, remove the wiring to the compressor before turning on the power supply.

Then, the backup setup for the outdoor unit in cooling season has finished.



12. OIL LEVEL JUDGMENT DISPLAY

The judgment result of the current oil level of the compressor can be confirmed by the switch setup on the interface P.C. board of the outdoor unit.

Confirm the result in the following procedure.

1. Operation procedure

1) Start the operation.
2) Set up the switches on the interface P.C. board of the outdoor unit of which judgment result of oil level is to be confirmed as shown below.

   SW01/SW02/SW03 = 1/16/1

3) The judgment result of the oil level is displayed on 7-segment display.

   7-segment display [oL] [A00]

   The right 3 digits indicate the judgment result. The judgment results of the oil level in compressor 1 and compressor 2 are displayed.

   (Example: A ○ □ = ○ : Oil level result of compressor 1, □ : Oil level result of compressor 2

Display example

7-segment display **[oL] [A00]** : Oil level is appropriate in compressor 1 and 2.
[oL] [A01] : Oil level is appropriate in compressor 1, and shortage in compressor 2
[oL] [A20] : Oil shortage in compressor 1, and appropriate in compressor 2

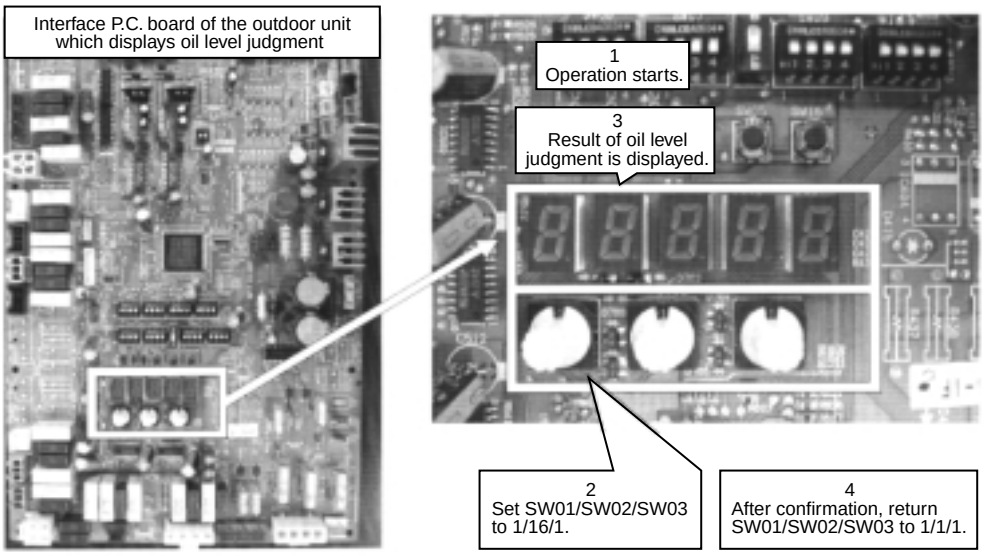
Judgment result in compressor 2
Judgment result in compressor 1

For the contents of judgment result, refer to the following table.)

Judgment result of oil level

7-segment display	Judgment result	Contents
0	Appropriate	Oil level inside of the compressor is appropriate.
1 2	Shortage	Shortage of oil level in the compressor (Both A1 and A2 indicate shortage.) If this judgment continues, the system stops for protection.
A	TK1 circuit error	TK1 circuit error is considered. If this judgment continues, the system stops for protection.
B	TK2 circuit error	TK2 circuit error is considered. If this judgment continues, the system stops for protection.
C	TK3 circuit error	TK3 circuit error is considered. If this judgment continues, the system stops for protection.
D	TK4 circuit error	TK4 circuit error is considered. If this judgment continues, the system stops for protection.

4) After confirmation, return SW01/SW02/SW03 to (1/1/1).



13. REFRIGERANT RECOVERY WHEN REPLACING THE COMPRESSOR

13-1. Refrigerant Recovery in the Troubled Outdoor Unit

A pump-down function if prepared to this system. For multiple outdoor unit system, execute pump-down by using the normal outdoor units and refrigerant can be recovered from the outdoor unit to be repaired

13-1-1. Before Refrigerant Recovery Operation

Pay attention to the following items during pump-down operation.

Note 1) The refrigerant recovery rate changes with the outside temperature, etc. in the pump-down operation. When the pump-down operation has finished, be sure to recover the remaining gas using a recovery device and measure the recovered refrigerant amount. (Executing pump-down operation when pump-down operation is operated with heating accumulator of the outdoor unit to be repaired improves refrigerant recovery rate.)

Note 2) After this work, the system cannot operate until the defective outdoor unit has been repaired. (As the operation becomes refrigerant overcharge operation, a continuous operation is unavailable.)

Note 3) While both outdoor pulse motor valves are closed (cannot open the valves), the refrigerant in the heat exchanger cannot be recovered. If executing welding after pump-down operation, recover the refrigerant in the heat exchanger before work.

13-1-2. Refrigerant Recovery Procedure

(In case of no backup operation for outdoor unit)

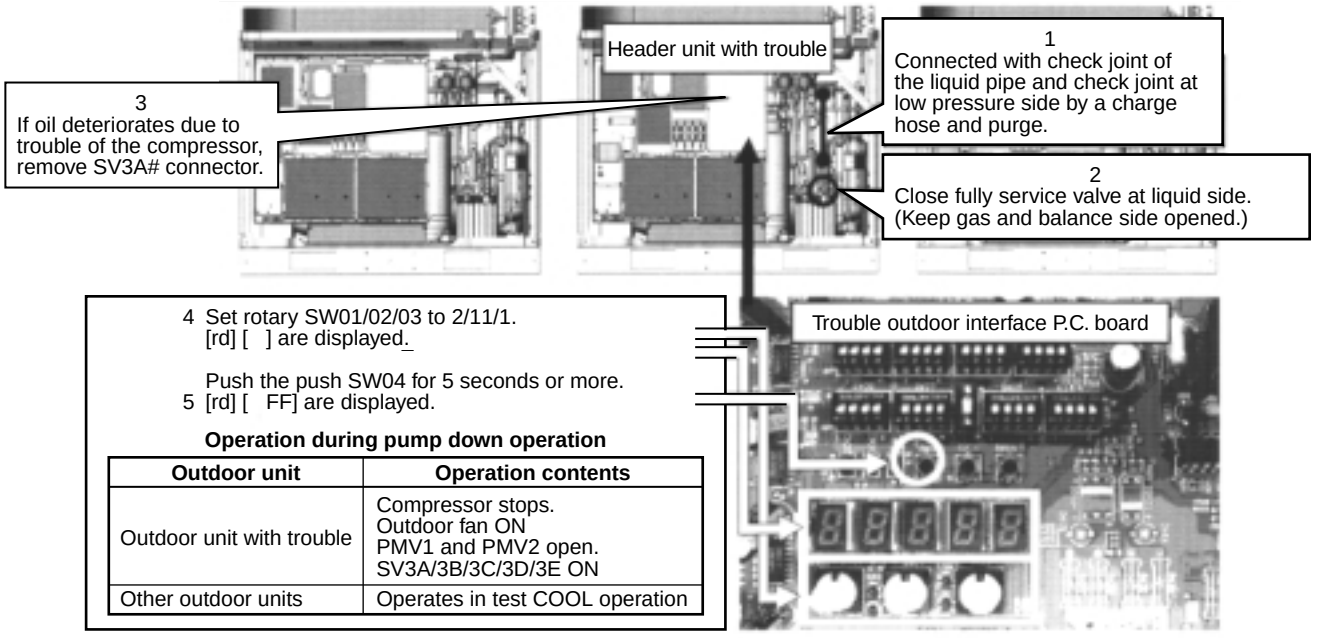
<Work procedure>

Turn on the power supply of the system, and stop status of system operation.

If a trouble is an insulation error of the compressor, remove wiring to the compressor before turning on the power supply.

[Setup for the outdoor unit with trouble]

1. Using a charge hose, connect the check joint of the liquid pipe and the check joint at low-pressure side, and then purge the air in the hose. (To recover refrigerant in the heat exchanger and the liquid tank)
2. Close fully the service valve of the liquid pipe of the outdoor unit with trouble. (Keep service valve of the gas pipe and the balance pipe opened.)
3. If it is considered that the oil has deteriorated due to trouble of the compressor, take off SV3A valve connector of the outdoor unit with trouble so that the deteriorated oil does not flow in the other outdoor units.
4. Set the rotary SW01/02/03 to 2/11/1 on the interface P.C. board of the troubled outdoor unit and then push SW04 for 5 seconds or more after [rd] [ ] have been displayed on 7-segment display section.
5. [rd] [FF] have been displayed on 7-segment display, and then a pump-down operation starts.
   ∗ When interrupting the operation, turn off the power supplies of all the outdoor units or push SW05 on the interface P.C. board.

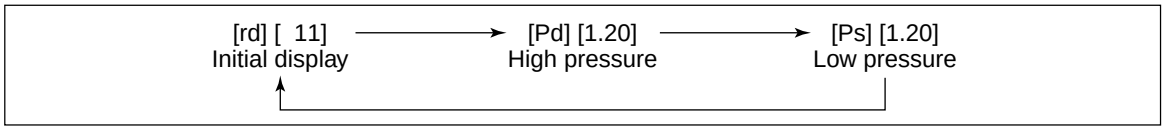


Operation during pump down operation

Outdoor unit	Operation contents
Outdoor unit with trouble	Compressor stops. Outdoor fan ON PMV1 and PMV2 open. SV3A/3B/3C/3D/3E ON
Other outdoor units	Operates in test COOL operation

6. Close fully the service valve of the gas pipe of the troubled outdoor unit approx. 10 minutes after the system has started.
7. Push the push SW04 of the troubled outdoor unit in order to display the pressure data (MPa).
   (Every pushing SW04, the displayed data changes successively.)

Display Example



[Selection of outdoor unit for pressure adjustment]

8. For the outdoor units which are operating with pump-down mode, the outdoor unit having the least unit number is selected as the outdoor unit for adjustment of pressure.

> **Unit No.**
> While SW01/02/03 are set to 1/1/1, the number displayed on 7-segment display indicates the unit No.
> ([U#] [– – –]: # indicates the unit No.)

[Selection for outdoor units other than unit for adjustment of pressure and troubled unit]

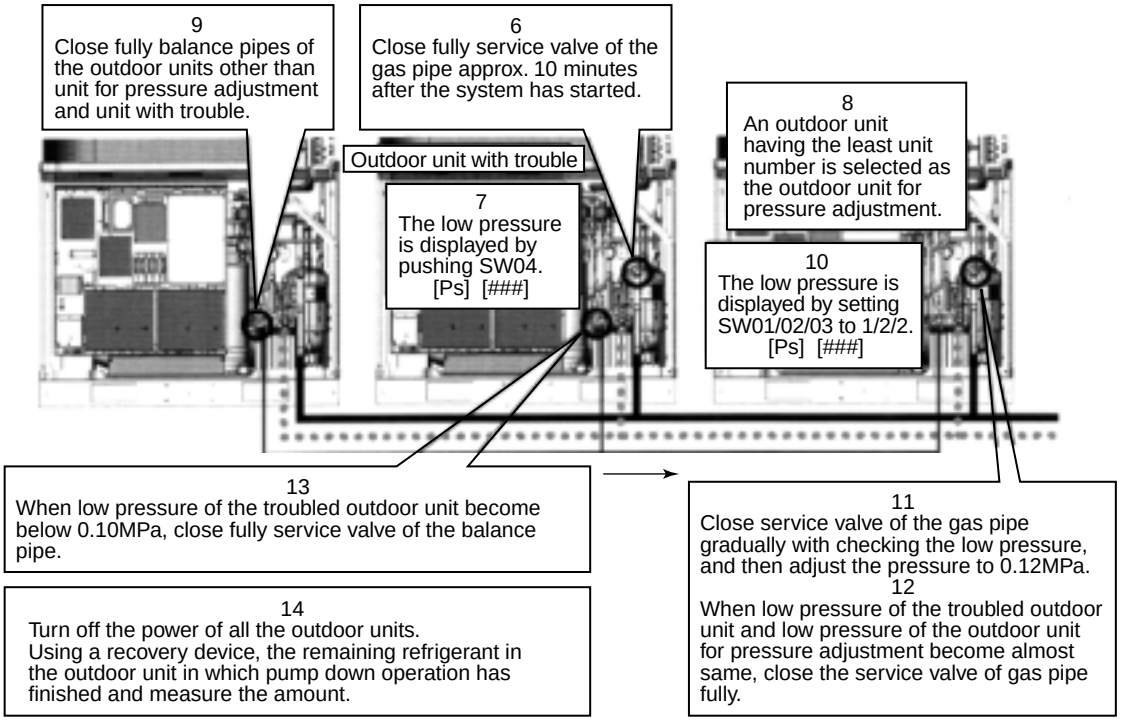
9. Keep only the service valve of balance pipe of the unit for pressure adjustment and the troubled unit fully opened, and close fully the service valves of other outdoor unit balance pipes.

[Setup for outdoor unit for adjustment of pressure]

10. Set up the rotary SW01/02/03 to 1/2/2 on the interface P.C. board of the outdoor unit for adjustment of pressure.
11. As the low-pressure data is displayed on 7-segment display section, close the service valves of the gas pipe slowly by confirming by confirming the pressure data, and then adjust so that the pressure becomes around 0.12MPa.
12. When the low-pressure of the troubled outdoor unit has become almost same as that of the unit for pressure adjustment, close fully the service valve of the gas pipe of the unit for pressure adjustment after operation for a while.

[Setup for the troubled outdoor unit]

13. When the low-pressure of the troubled outdoor unit becomes below 0.10MPa, close fully service valve of the balance pipe and then push SW05 on the interface P.C. board to finish the pump-down operation.
14. Turn off the power supplies of all the outdoor units, and use a refrigerant recovery device to recover the remaining refrigerant in the outdoor unit which the pump-down operation has completed. Be sure to measure the recovered refrigerant amount. (It is because addition of refrigerant corresponding to recovered amount is necessary after repair.)



All of the refrigerant recovery work has finished.

(Backup operation of the outdoor unit is being executed)

<Outline>

When the power supply of the outdoor unit cannot be turned on under condition that a backup operation is set up for the troubled outdoor unit, correct refrigerant recovery procedure is different. Try to recover refrigerant in the following procedure.

However in the case of outdoor backup operation in cooling season or the troubled unit ON during outdoor backup operation, recover the refrigerant in the work procedure in which the abovementioned “Outdoor Unit Backup Setup” is not performed.

If the backup for the outdoor unit is set up under condition that the troubled unit is turned on, return the communication connector [CN03] between outdoor units on the interface P.C. board of the corresponding unit to the original status, reset the power supply, and then start the recovery operation in the above work procedure.

Note) If the power of the troubled unit cannot be turned on, the solenoid valve PMV of the unit cannot be turned on. Therefore the refrigerant recovery amount decreases compared with the usual pump-down operation. Using a refrigerant recovery device, recover the remaining gas in the unit and measure the recovered amount.

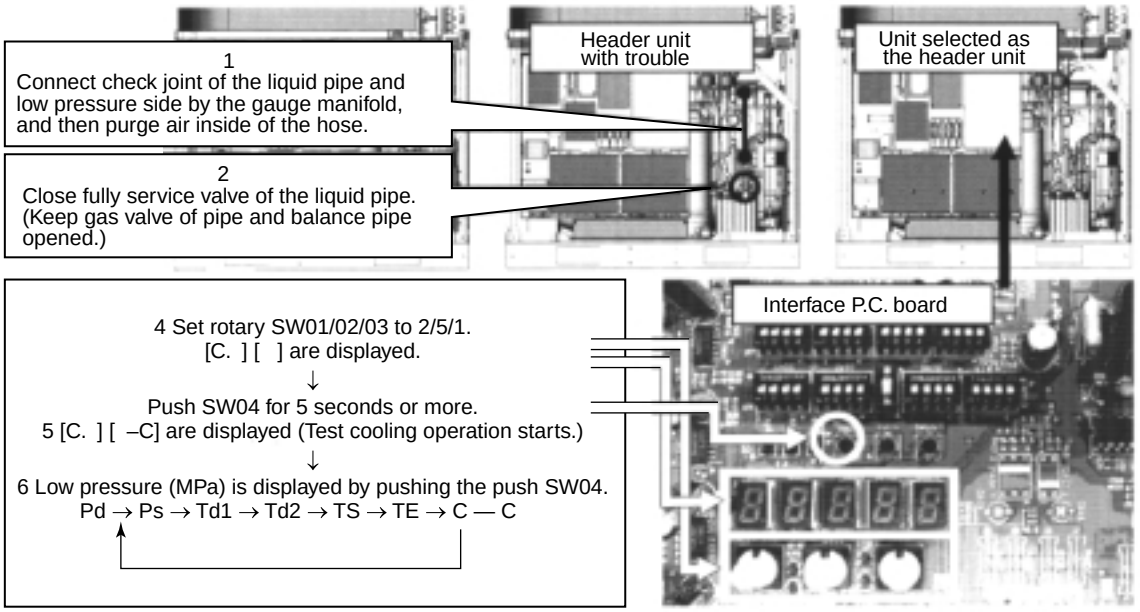
<Work procedure>

[Setup for the troubled outdoor unit]

1. Using a gauge manifold, connect the check joint of the liquid pipe and the low-pressure side, and then purge air in the hose. (To recover refrigerant in the heat exchanger and the liquid tank)
2. Close fully the service valve of the liquid pipe of the outdoor unit with trouble. (Keep service valve of the gas pipe and the balance pipe opened.)

[Setup for the unit selected as header unit]

3. Set up the rotary SW01/02/03 to 2/5/1 on the interface P.C. board of the header outdoor unit, and push the push SW04 for 5 seconds or more after [C.] [ ] have been displayed on 7-segment display section.
4. The system operates in the test cooling operation after [C.] [– C] have been displayed on 7-segment display section.
   Set up the rotary SW01/02/03 to 1/2/2 on the interface P.C. board of the header outdoor unit to display the low-pressure data (MPa) on 7-segment display section.
5. Push the SW04 for 2 seconds, then low pressure (MPa) is displayed on 7-segment.



6. Close fully the service valve of the gas pipe on the troubled outdoor unit approx. 10 minutes after the system has started.

[Setup for outdoor unit for adjustment of pressure]

7. Select the header unit as the unit for pressure adjustment.

[Setup for outdoor units other than header unit and troubled unit]

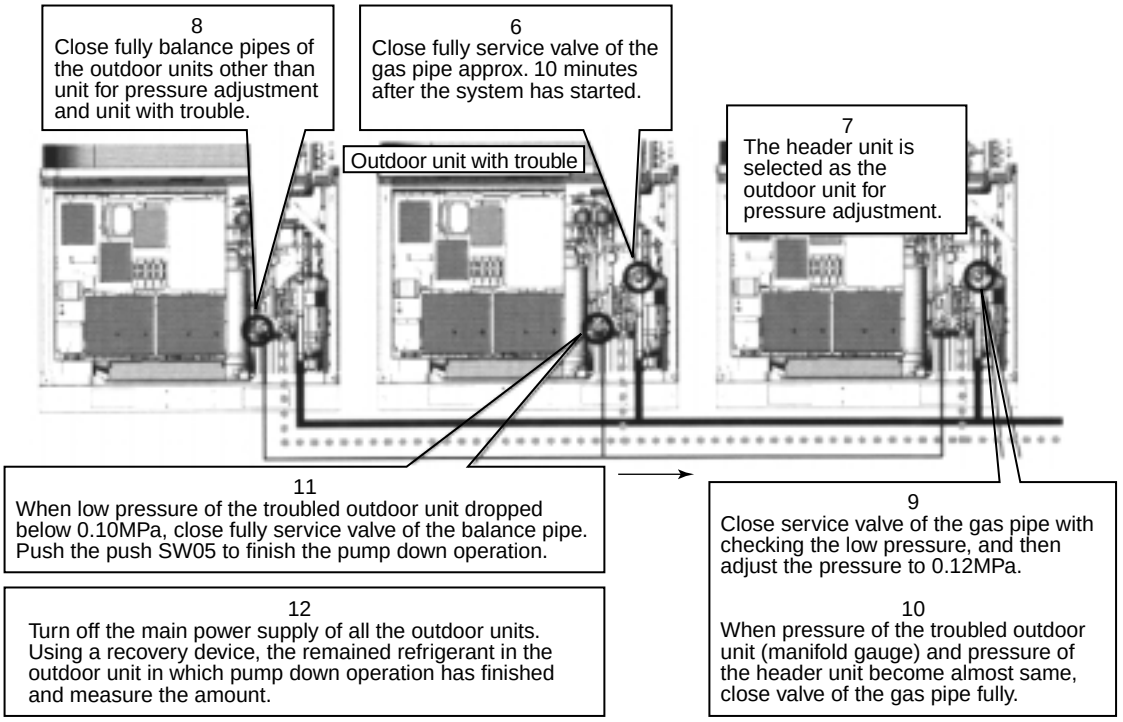
8. Keep only the balance pipes of the header unit and the troubled outdoor unit fully opened, and close fully the service valves of other outdoor unit balance pipes.

[Setup for header unit]

9. As the low-pressure data is displayed on 7-segment display section, close the service valves of the gas pipe gradually with confirming the pressure data, and then adjust so that the pressure becomes around 0.12MPa or equivalent.
10. When the manifold gauge pressure of the troubled outdoor unit has become almost same as with low pressure of the header unit, close fully the service valve of the gas pipe of the unit for pressure adjustment after operation for a while.

[Setup for the troubled outdoor unit]

11. When the manifold gauge pressure of the troubled outdoor unit becomes below 0.10MPa, close fully packed valve of the balance pipe and then push SW05 on the interface P.C. board to finish the pump-down operation.
12. Turn off the main power supplies of all the outdoor units, and use a refrigerant recovery device to recover the remaining refrigerant in the outdoor unit which the pump-down operation has completed. Be sure to measure the recovered refrigerant amount. (It is because addition of refrigerant corresponding to recovered amount is necessary after repair.)



All of the refrigerant recovery work has finished.

Return all SW01/02/03 of the header unit to (1/1/1) to complete the work.

13-2. How to Operate the System during Repairing of the Defective Outdoor Unit

<Work procedure>

1. Follow to the abovementioned **"13-1. Refrigerant Recovery in the Troubled Outdoor Unit"**.
2. Next, recover the refrigerant in the system by using a recovery device, etc.
   The refrigerant amount to be recovered is determined based upon the capacity of the troubled outdoor unit. (See the following table.)

   Example) In a case of backup for 10HP-outdoor unit in 30HP system:
   in the original system HP (30HP system) = 37.5kg
   Refrigerant amount in system HP (20HP system) after backup = 28.0kg
   Refrigerant amount to be recovered = 37.5 – 28.0 = 9.5kg

3. For the unit which refrigerant has been recovered, execute "Outdoor Unit Backup Setup" in another section.
   All the work has finished.

System HP	Combination of outdoor units				Refrigerant amount (kg)
5	5				8.5
6	6				8.5
8	8				14.0
10	10				15.0
12	12				16.0
14	8	6			21.0
16	8	8			25.0
18	10	8			25.0
20	10	10			28.0
22	8	8	6		33.5
	12	10			30.0
24	8	8	8		33.5
	12	12			32.0
26	10	8	8		33.5
28	10	10	8		35.0
30	10	10	10		37.5
32	8	8	8	8	44.0
	12	10	10		38.5
34	10	8	8	8	44.0
	12	12	10		40.0
36	10	10	8	8	44.0
	12	12	12		41.5
38	10	10	10	8	44.0
40	10	10	10	10	45.0
42	12	10	10	10	46.0
44	12	12	10	10	48.0
46	12	12	12	10	50.0
48	12	12	12	12	52.0

13-3. Process after Repair

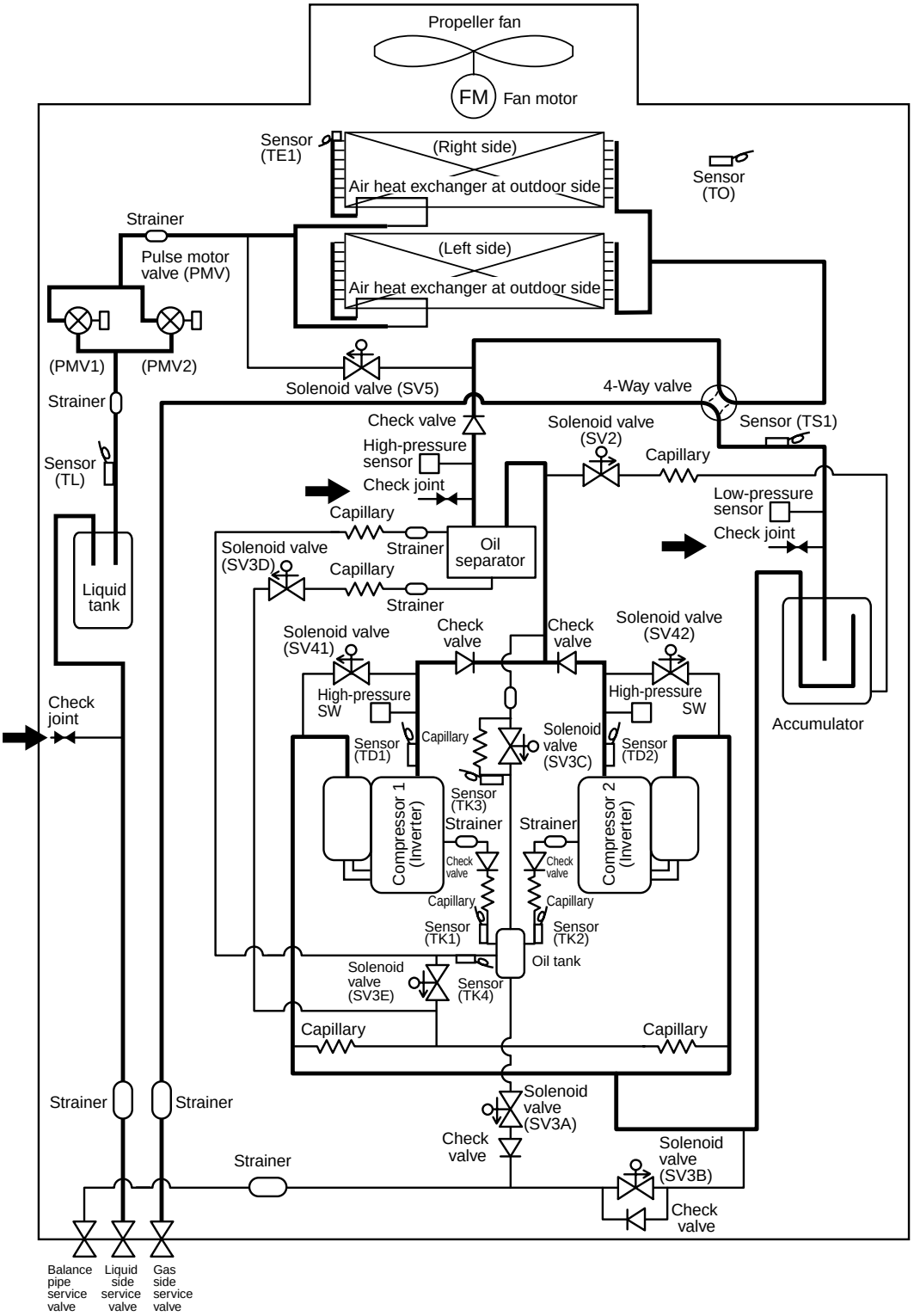
After completion of the repair work, perform vacuuming in the outdoor unit in the following procedure.

<Work procedure>

1. Short CN30 on the interface P.C. board of the outdoor unit which repair work has completed, to open PMV fully.

   NOTE) The full opening operation of PMV by CN30 short-circuiting returns to full closing after 2 minutes. To continue full-opening status, turn off the power supply of the outdoor unit within 2 minutes after CN30 short-circuiting.

2. **Be sure to perform vacuuming from the following three check joints. (Liquid pipe, discharge pipe, and suction pipe)**



14. LEAKAGE/CLOGGING OF OIL-EQUALIZATION CIRCUIT

Check code list for leakage, clogging of outdoor refrigerant circuit and oil circuit parts

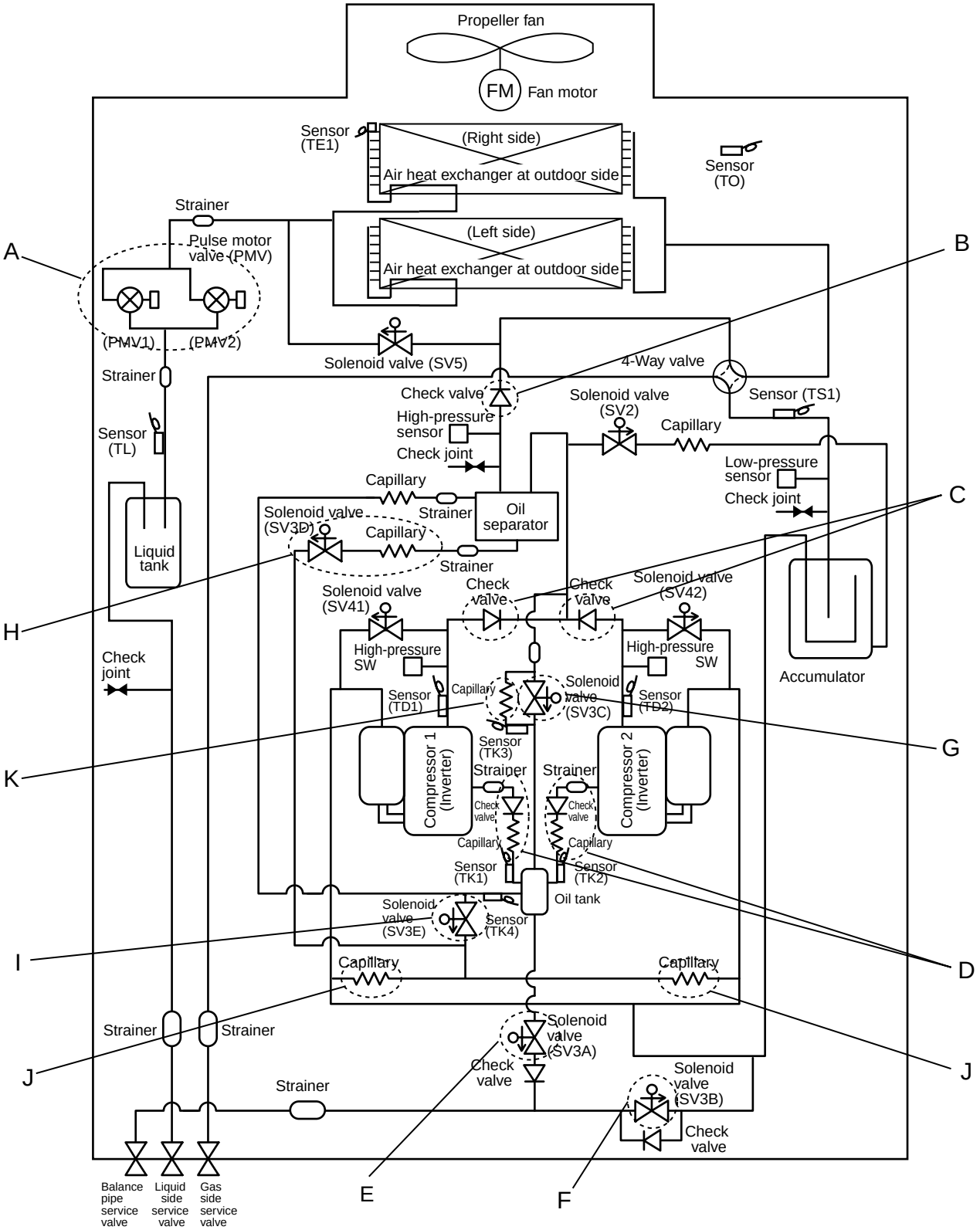
<Trouble with clogging>

Part name	Position with trouble (See next page.)	Unit issuing check code	Check code to be detected		Phenomena (Corresponding unit)
Outdoor PMV	A	Corresponding unit	High-pressure protective operation Low-pressure protective operation Discharge temp. error	P20 H06 P03 P17	High-pressure up Low-pressure down Discharge temp. up
Check valve of main discharge pipe collective section	B	Corresponding unit	High-pressure protective operation High-pressure SW system error	P20 P04-XX	Abnormal high-pressure up
Check valve of discharge pipe	C	Corresponding unit	High-pressure SW system error	P04-XX	Abnormal high-pressure up
Check valve of oil-equalization circuit Capillary Strainer	D	Corresponding unit	Oil level detective circuit error Oil level down error	H16-XX H07	Oil-equalization circuit error or oil-shortage judgment
SV3A valve	E	Other connected unit	Oil level down error	H07	Excessive oil amount
SV3B valve	F	Corresponding unit	Oil level down error	H07	Shortage of oil amount
SV3C valve	G	Other connected unit	Oil level down error	H07	Excessive oil amount
SV3D valve SV3D valve circuit capillary Strainer	H	Corresponding unit	Oil level down error	H07	Shortage of oil amount
SV3E valve	I	Corresponding unit	Oil level detective circuit error Oil level down error	H16-04 H07	Oil-equalization circuit error Judgment of shortage Shortage of oil amount
Oil return capillary	J	Corresponding unit	Oil level down error	H07	Shortage of oil amount
SV3C bypass capillary	K	Corresponding unit	Oil level detective circuit error	H16-03	Oil-equalization circuit error

< Trouble with leakage>

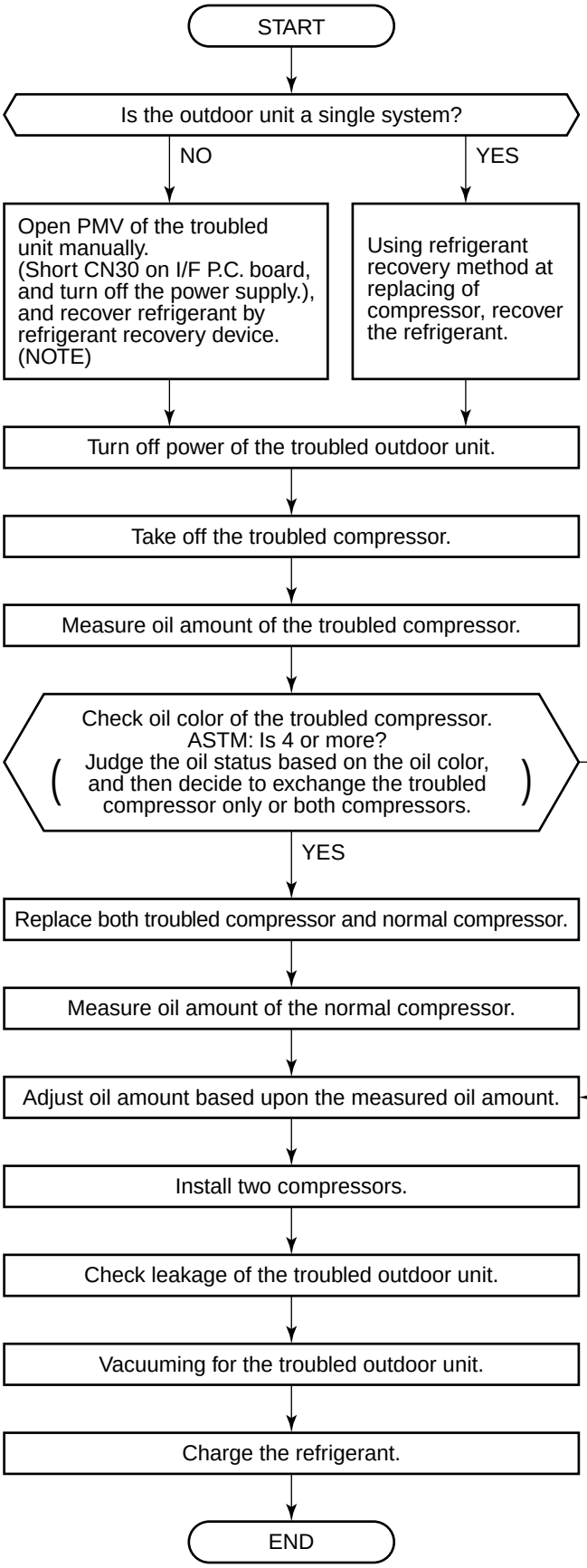
Part name	Position with trouble (See next page.)	Unit issuing check code	Check code to be detected		Phenomena (Corresponding unit)
Outdoor PMV	A	Corresponding unit	Outdoor liquid back error Oil level down error	P13 H07	Refrigerant stagnation
Check valve of main discharge pipe collective section	B	Corresponding unit	Oil level down error Compressor breakdown Compressor error (Lock)	H07 H01-XX H02-XX	Refrigerant stagnation
Check valve of discharge pipe	C	Corresponding unit	Oil level down error Compressor breakdown Compressor error (Lock)	H07 H01-XX H02-XX	Refrigerant stagnation
Check valve of oil-equalization circuit	D	Corresponding unit	Oil level down error	H07	Excessive oil amount (Leaked side) Shortage of oil amount (Normal side)
SV3A valve	E	Corresponding unit	Oil level down error	H07	Shortage of oil amount
SV3C valve	G	Corresponding unit	Oil level down error	H07	Judgment of oil shortage

NOTE) XX: Error on sub-code


Propeller fan
FM
Fan motor
Sensor (TE1)
(Right side)
Air heat exchanger at outdoor side
Sensor (TO)
Strainer
Pulse motor valve (PMV)
(Left side)
Air heat exchanger at outdoor side
A
B
(PMV1)
(PMV2)
Solenoid valve (SV5)
4-Way valve
Strainer
Check valve
Solenoid valve (SV2)
Sensor (TS1)
Sensor (TL)
High-pressure sensor
Capillary
Check joint
Low-pressure sensor
Check joint
C
Capillary
Solenoid valve (SV3D)
Strainer
Oil separator
Capillary
Liquid tank
Strainer
H
Solenoid valve (SV41)
Check valve
Check valve
Solenoid valve (SV42)
Check joint
High-pressure SW
High-pressure SW
Accumulator
Capillary
Solenoid valve (SV3C)
Sensor (TD1)
Sensor (TD2)
G
Sensor (TK3)
K
Compressor 1 (Inverter)
Compressor 2 (Inverter)
Strainer
Strainer
Check valve
Check valve
Capillary
Capillary
Sensor (TK1)
Sensor (TK2)
Oil tank
Solenoid valve (SV3E)
Sensor (TK4)
I
D
Capillary
Capillary
Strainer
Strainer
Solenoid valve (SV3A)
J
J
Check valve
Solenoid valve (SV3B)
Strainer
Check valve
Balance pipe service valve
Liquid side service valve
Gas side service valve
E
F

15. REPLACING COMPRESSOR

15-1. Compressor Replacing Procedure (Outline)



⚠ WARNING

Never recover the refrigerant into outdoor unit.

Be sure to use a refrigerant recovery device for refrigerant recovery in reinstallation or repair work. Recovery into outdoor unit is unavailable; otherwise a serious accident such as rupture or injury will be caused.

NOTE) Full opening operation of PMV by CN30 short-circuiting returns full closing when 2 minutes passed.
To continue full-opening status, turn off power of the outdoor unit within 2 minutes.

* This flowchart is the standard one of compressor replacing. Various cases are considered at each field
Replace the compressors based on the following conditions of judgment.

1. Oil of 1900cc is charged in a compressor for service.
2. Oil amount is 3800cc in an outdoor unit at shipment.
3. When a compressor is removed, it usually includes oil with 800 to 1400cc.
   Oil separator usually holds oil with 0 to 1000cc.

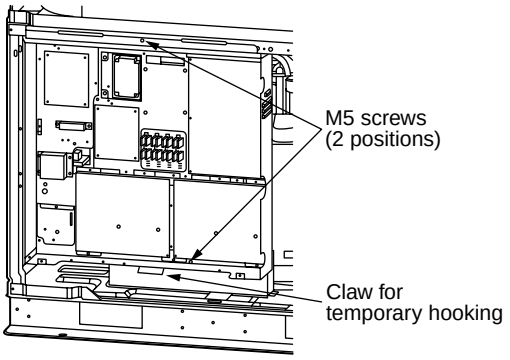
15-2. Replacing Compressor

Concept of exchange

When exchanging the compressor, extract oil from the defective compressor and decide to exchange the defective compressor or two compressors based upon the limit sample.
(If oil color ASTM is 4.0 or more, both compressors should be replaced.)

⚠ CAUTION

A compressor weighs 20kg or more. The two personnel should work for a compressor.

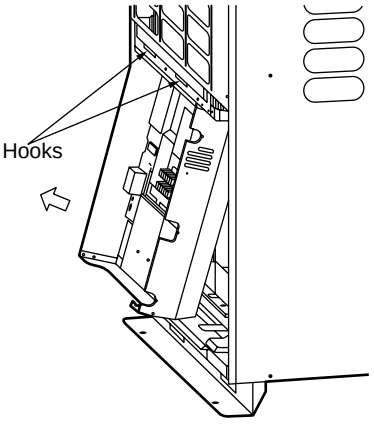


<Removal of defective compressor>

- Turn off power of the troubled outdoor unit.
- Take off the front panel. (M5 × 7)
- Take off cover of the electric parts box. (M4 × 2)
- Take off the screws (M5 × 2) fixing the electric parts box to the outdoor unit.
- Take off claw for temporary hooking from the lower part of the electric parts box.

  (NOTE) Pay attention that the electric parts box may fall out due to the center of gravity.
- Take off the hooks from the upper part of the electric parts box and move it to the valve side.

  (NOTE) If installed status of the moved electric parts box is unstable, it may fall down. When the electric parts box is unstable, take off all the cables inside of the electric parts box, and then remove the entire electric parts box completely.



- Remove the lower duct. (M4 × 4)
- Take off the sound-insulation mat.
- Remove the crank case heater.
- Take off the terminal cover of the compressor, the wiring to the compressor, and the case thermostat unit.

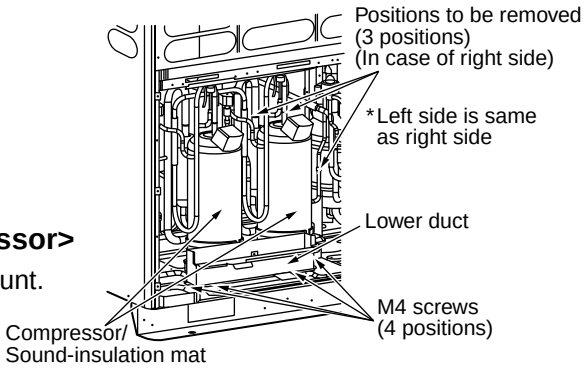
  (NOTE) Be sure to apply insulate to the removed cable terminals with insulating tape, etc. To exchange the compressor, remove cables of the compressor only.

⚠ WARNING

Be careful that oil in the pipe may emit fire when broiling the welded point with a burner.

- Remove the discharge pipe, suction pipe, and oil-equation pipe.
- Take off the hexagonal bolts fixing the compressor.
  (One side of hexagon: 13mm × 2 pcs. a compressor)

  (NOTE) Only two hexagonal bolts are provided to a compressor, but it is not lack.
- Remove the compressor.



<Measurement of oil amount in the defective compressor>

- Put the troubled compressor on a scale and measure oil amount.

  Oil amount of the troubled compressor:

  A [cc] = (Removed compressor mass (kg) –23.5) × 1042

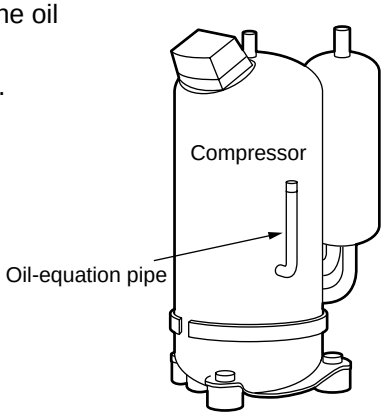
  (Specific gravity of oil: 1042 [cc/kg])

  (NOTE)

  • When the compressor holds no oil, the compressor mass is 23.5kg.

<Color check for oil of the defective compressor>

- Lay down the troubled compressor, extract a little amount of oil from the oil-equalization pipe, and then check the oil color based on the oil color sample.
- Determine No. of compressor t be replaced by checking oil color.
  - ASTM: Below 4 → Replace the troubled compressor only.
  - ASTM: Above 4 → Replace the troubled compressor and the normal compressor.



[In case of replacing of troubled compressor only]

<Adjustment of oil amount in the service compressor> (Oil amount 1900cc at shipment)

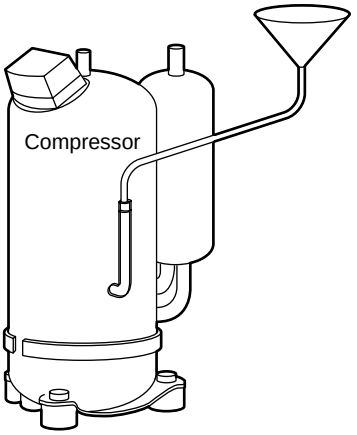
- Adjust oil amount from oil amount of defective compressor: A [cc] by following to the contents below.

1. In case of oil amount of the troubled compressor: A [cc] is $0 \leq A < 1000$
   1) Adjust oil amount in the service compressor to 1000cc.
      (Lay down the service compressor, and then extract oil by 900 [cc] from the oil-equalization pipe.)

   (NOTE)
   - Do not extract oil over 900 [cc] because a trouble may be caused on the compressor.

   > - If oil amount of the troubled compressor is below 500cc, a trouble on the oil-equalization circuit, etc is considered. Check the compressor based upon **"15-3. Check procedure search the cause of compressor oil shortage"**.

2. In case of oil amount of the troubled compressor: A [cc] is $1000 \leq A < 1900$
   1) Adjust oil amount in the service compressor to A cc.
      (Lay down the service compressor and then extract oil by (1900 - A) [cc] from the oil-equalization pipe.)
3. In case of oil amount of the troubled compressor: A [cc] is $1900 \leq A$
   1) Adjust oil amount in the service compressor to A cc.
      (Insert a hose into the discharge pipe or oil-equation pipe of the service compressor, and then add oil by (A - 1900) [cc] using a funnel or so on.)



[In case of replacing of both troubled and normal compressors]

<Removal of normal compressor>

- Remove the normal compressor same as the case to remove the troubled compressor.

(NOTE)

- Be sure to apply insulation to the removed cable terminals with insulating tape, etc.

⚠ WARNING

Be careful that oil in the pipe may emit fire when broiling the welded point with a burner.

<Measurement of oil amount in the normal compressor>

- As same as measurement of oil amount in the troubled compressor, put the compressor on a scale and measure oil amount.

  Oil amount of the normal compressor: B [cc] = (Removed compressor mass (kg) –23.5) × 1042
  (Specific gravity of oil: 1042 [cc/kg])

(NOTE)

- When the compressor holds no oil, the compressor mass is 23.5kg.

<Adjustment of oil amount in the service compressor>

- Adjust oil amount by the contents below:

Based on oil amount of troubled compressor: A[cc] and oil amount of normal compressor: B [cc]

1. In case of the total oil amount of the compressors: A + B [cc] is $0 \leq A + B < 2000$
   1) Adjust oil amount in the two service compressors to 1000cc each. (Total: 2000cc)
      - Lay down the two service compressors, and then extract oil by 900 [cc] from each oil-equalization pipe.

   (NOTE)

   - Do not extract oil over 900 [cc] because a trouble may be caused on the compressor.

   - If oil amount of the troubled compressor is below 500cc, a trouble on the oil-equalization circuit, etc is considered. Check the compressor based upon **"15-3. Check procedure search the cause of compressor oil shortage"**.

2. In case of total oil amount: A + B [cc] is $2000 \leq A + B < 3800$

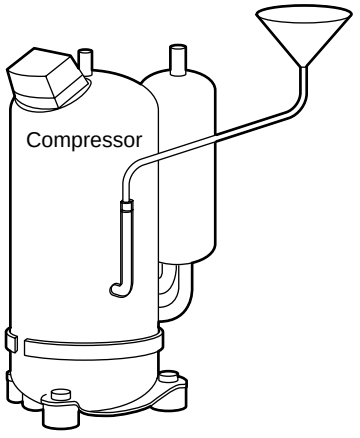
   1) Adjust oil amount in the two service compressors to $\frac{A + B}{2}$ [cc] each.

      - Lay down the two service compressors and then extract oil by $\frac{3800 - (A + B)}{2}$ [cc] from each oil-equalization pipe.

3. In case of total oil amount of the compressors: A + B [cc] is $3800 \leq A$

   1) Adjust oil amount in the two service compressors to $\frac{A + B}{2}$ [cc] each.

      (Insert a hose into the discharge pipe or oil-equalization pipe of the service compressor, and then add oil by $\left(\frac{A + B}{2} - 1900\right)$ [cc] using a funnel or so on.)



<Installation of compressor>

- Install the compressor in the reverse procedure of removal.
- **When removing the compressor, Fasten receptacle terminals of the compressor may be loosened. Prior to the installation, caulk a little to them with radio pinchers, reinsert them into the compressor, and then check there is no looseness.**

  (NOTES)

  - Only two hexagonal bolts are provided to a compressor, but it is not lacking.
  - The tightening torque of the hexagonal bolt to fix the compressor is 200kg/cm.
  - If oil has been extracted from the accumulator, braze the cutoff pipe after pinching.

<Vacuuming>

(In case of single outdoor system>

- Connect vacuum pump to the valve charge ports of the liquid and gas pipes and the check joint at high-pressure side, and then drive the vacuum pump.
- Vacuum until the vacuum low-pressure gauge indicates 1 (mmHg).

  (NOTE)

  - Before vacuuming, open PMV fully. Vacuuming may not be executed for the heat exchanger of the outdoor unit under condition of PMV closed.

(In case of multiple outdoor units system)

- **In case of conducting the refrigerant recovery at replacing the compressor, perform vacuuming as 13-3. Process after repair.**

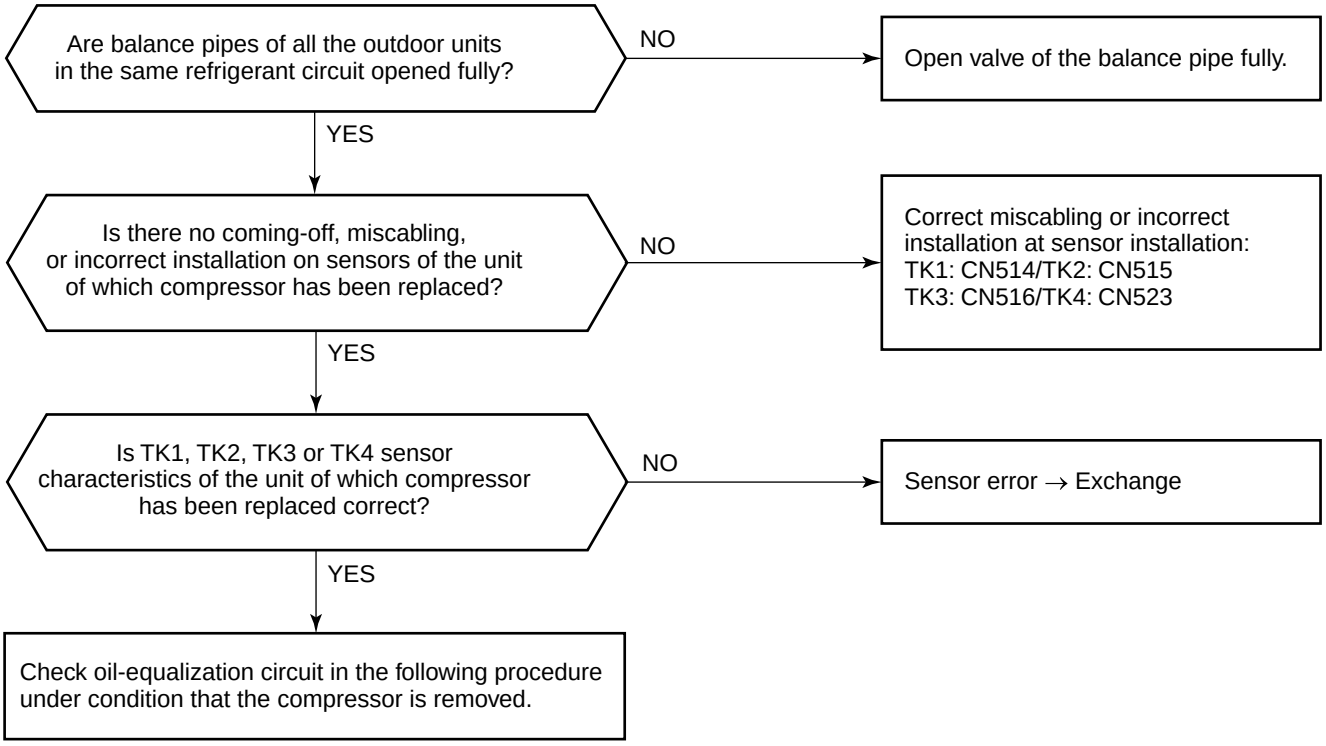
<Full opening of PMV>

- Turn on power of the outdoor unit.
- Short CN30 on I/F P.C. board of the outdoor unit.
- Turn off power of the outdoor unit within 2 minutes after short-circuiting.

<Refrigerant charging>

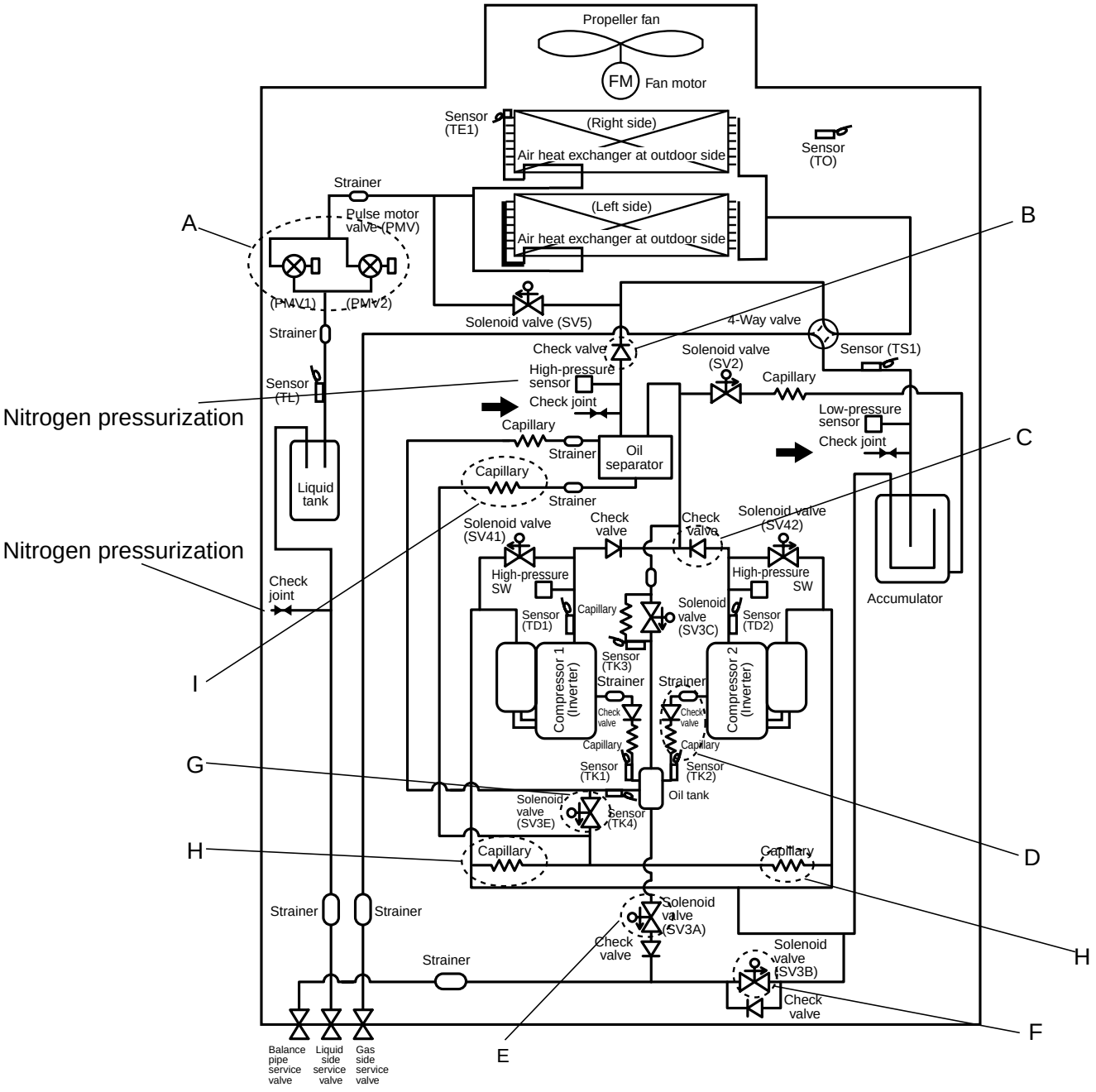
- Add the same amount of refrigerant as the remaining refrigerant refrigerant from the charge port of the service valve at liquid side.

15-3. Check Procedure to Search the Cause of Compressor Oil Shortage



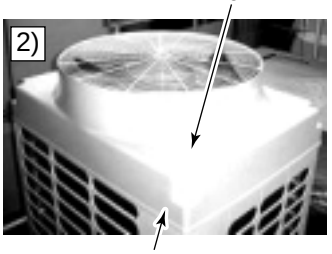
Check items and procedure for the oil-equalization circuit under condition that the compressor is removed

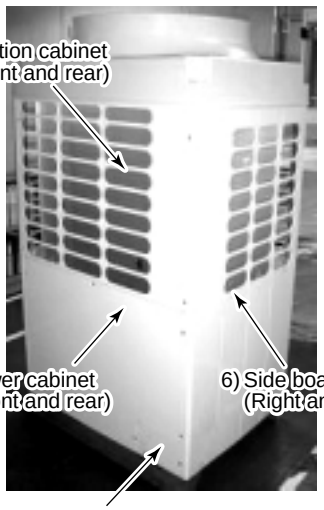
	Check items	Position	Procedure
Check of refrigerant stagnation cause in compressor	Outdoor PMV leakage Check valve leakage of main discharge pipe	A B	1) Press nitrogen gas in from check joint of liquid pipe, and check pressure at check joint of discharge pipe. If pressure of check joint of discharge pipe becomes high, leakages from outdoor PMV and check valve of main discharge pipe are considered. Exchange the parts. 2) If the pressure up is not found, open outdoor PMV fully and recheck pressure. If pressure of check joint of discharge pipe becomes high, leakage from check valve of main discharge pie is considered. Exchange the parts.
	Check valve leakage of discharge pipe	C	3) When gas leaks from welded part of oil-equalization pipe where compressor has been removed under condition that nitrogen gas is pressed in from check joint of main discharge pipe, leakage from check valve of main discharge pipe is considered. Exchange the parts.
	Check valve leakage of oil-equalization circuit	D	4) When gas leaks from welded part of oil-equalization pipe where compressor has been removed under condition that nitrogen gas is pressed in from check joint of discharge pipe, leakage from check valve of oil-equalization circuit is considered. Exchange the parts.
Check of oil shortage cause in compressor	SV3A valve leakage SV3B valve clogging	E F	5) Open SV3B valve manually under condition that nitrogen gas is pressed in from check joint of discharge pipe. When gas leaks from welded part of suction pipe where compressor has been removed, SV3A valve leakage is considered. Exchange the parts. Next, open SV3A valve and SV3B valve manually. If gas leaks from welded part of suction pipe where compressor has been removed, SV3A valve leakage is considered. Exchange the parts.
	SV3E valve clogging. Clogging of oil-return capillary	G H	6) Open SV3E valve manually under condition that nitrogen gas is pressed in from check joint of discharge pipe. When gas does not output from welded part of suction pipe where compressor has been removed, there is clogging at SV3E valve or oil-return capillary. Exchange the parts.
	SV3D valve capillary clogging. Clogging of oil-return capillary	I H	7) Open SV3D valve manually under condition that nitrogen gas is pressed in from check joint of discharge pipe. When gas does not output from welded part of suction pipe where compressor has been removed, there is clogging at SV3D valve or oil-return capillary. Exchange the parts.

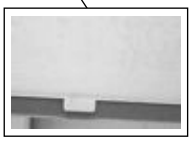

Propeller fan
FM
Fan motor
Sensor (TE1)
(Right side)
Air heat exchanger at outdoor side
Sensor (TO)
Strainer
Pulse motor valve (PMV)
(Left side)
Air heat exchanger at outdoor side
A
B
(PMV1)
(PMV2)
Solenoid valve (SV5)
4-Way valve
Strainer
Check valve
Solenoid valve (SV2)
Sensor (TS1)
High-pressure sensor
Capillary
Sensor (TL)
Check joint
Nitrogen pressurization
Capillary
Low-pressure sensor
Strainer
Oil separator
Check joint
C
Capillary
Liquid tank
Strainer
Solenoid valve (SV41)
Check valve
Check valve
Solenoid valve (SV42)
Nitrogen pressurization
High-pressure SW
High-pressure SW
Accumulator
Check joint
Capillary
Solenoid valve (SV3C)
Sensor (TD1)
Sensor (TD2)
Sensor (TK3)
I
Compressor 1 (Inverter)
Strainer
Strainer
Compressor 2 (Inverter)
Check valve
Check valve
Capillary
Capillary
G
Sensor (TK1)
Sensor (TK2)
Oil tank
Solenoid valve (SV3E)
Sensor (TK4)
H
Capillary
Capillary
D
Strainer
Strainer
Solenoid valve (SV3A)
Check valve
H
Strainer
Solenoid valve (SV3B)
Check valve
F
E
Balance pipe service valve
Liquid side service valve
Gas side service valve

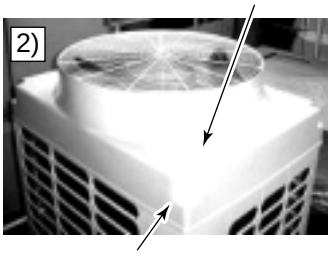
16. REOLACING METHOD OF PARTS

<table>
<tr><th>No.</th><th>Part to be exchanged</th><th>Work procedure</th><th>Remarks</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Cabinet</td><td>REQUIREMENT
Put on gloves during working; otherwise an injury may be caused by parts, etc.

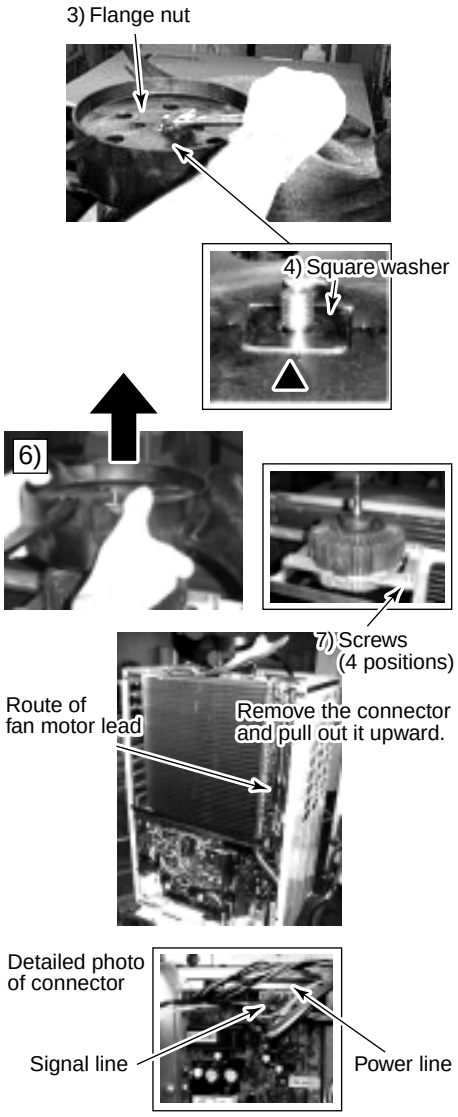
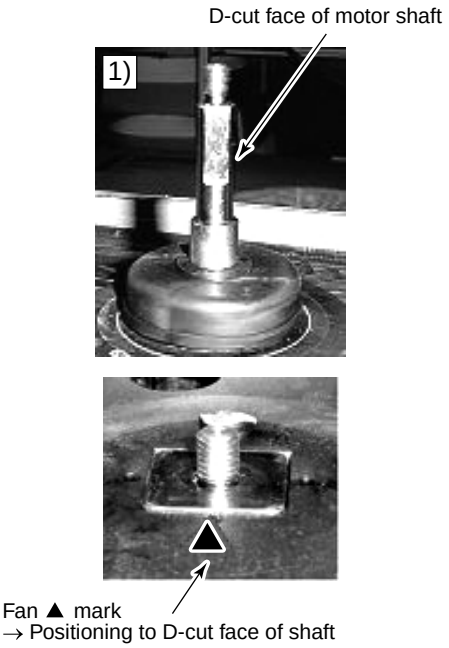
<Disassembling>
1) Stop operation of the air conditioner, and then turn off the switch of the breaker.
2) Take off screws of the discharge cabinet. (M5 × 10, 4 pcs.)
3) Take off screws (Front/rear at lower side) of the cabinet. (M5 × 10, 7 pcs. each)
4) Take off screws of the service panel. (M5 × 10, 3 pcs.)
5) Take off screws (Front/rear sides) of the suction cabinet. (M5 × 10, 4 pcs. each) (M4 × 10, 2 pcs. each)
6) Take off screws (Right/left sides) of the side panel. (M5 × 10, 4 pcs. each)</td><td>Discharge cabinet
 

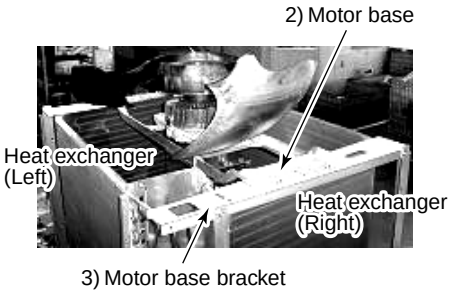
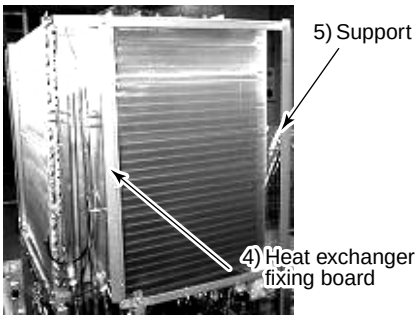
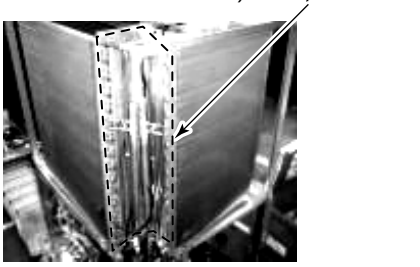
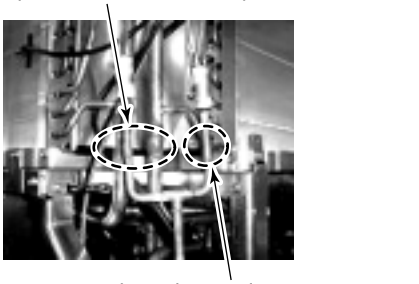
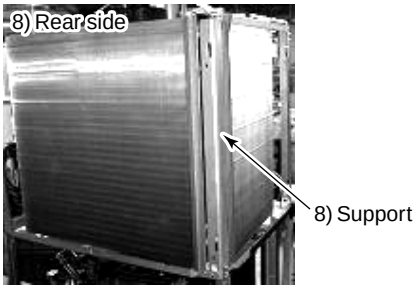
Screws (4 corners)
 
</td></tr>
<tr><td><Reassembly>
Reassemble the cabinet in the reverse procedure (6) → 1)) of the above “Disassembling”. However be sure to the following points when assembling the discharge cabinet.

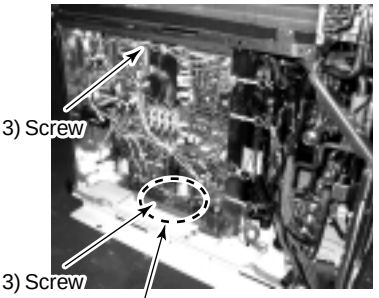
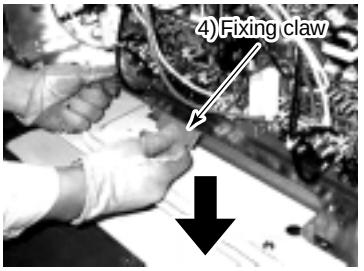
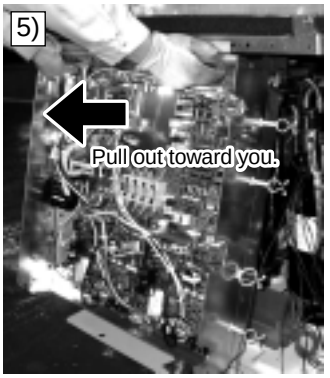
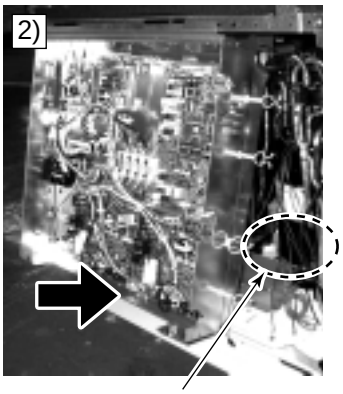
◆ Cautions when assembling the discharge cabinet
Fit the claws ∗ (6 positions) inside of the discharge cabinet surely. (If the claws come off, a vibrating noise may generate.)</td><td> 
* Hooking claw (2 × 3 positions each at longitudinal direction)
  </td></tr>
<tr><td>2</td><td>Propeller fan motor</td><td>REQUIREMENT
Put on gloves during working; otherwise an injury may be caused by parts, etc.

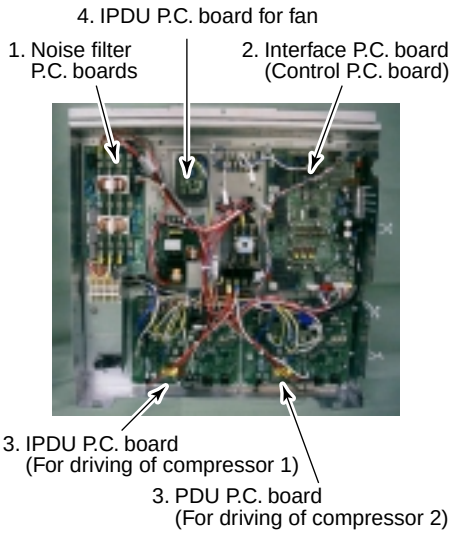
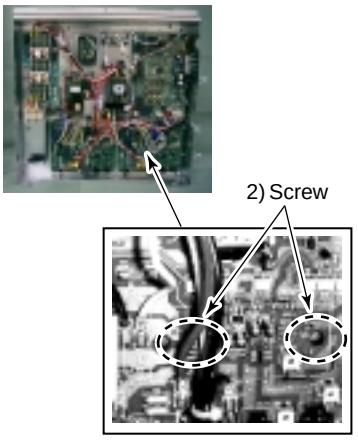
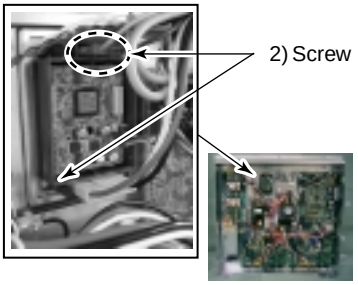
<Disassembling>
1) Stop operation of the air conditioner, and then turn off the switch of the breaker.
2) Take off screws of the discharge cabinet. (M5 × 16, 4 pcs.)</td><td>Suction cabinet
 

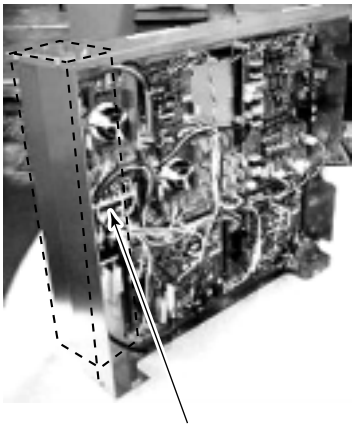
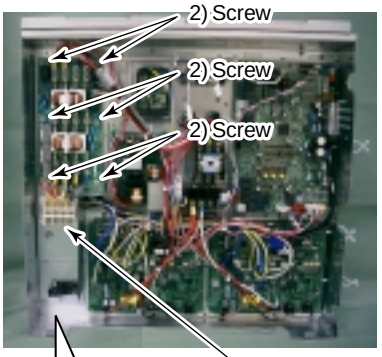
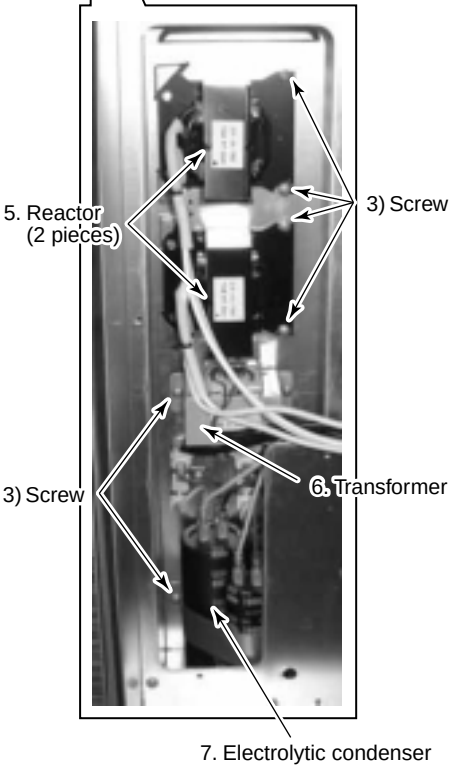
Screws (4 corners)</td></tr>
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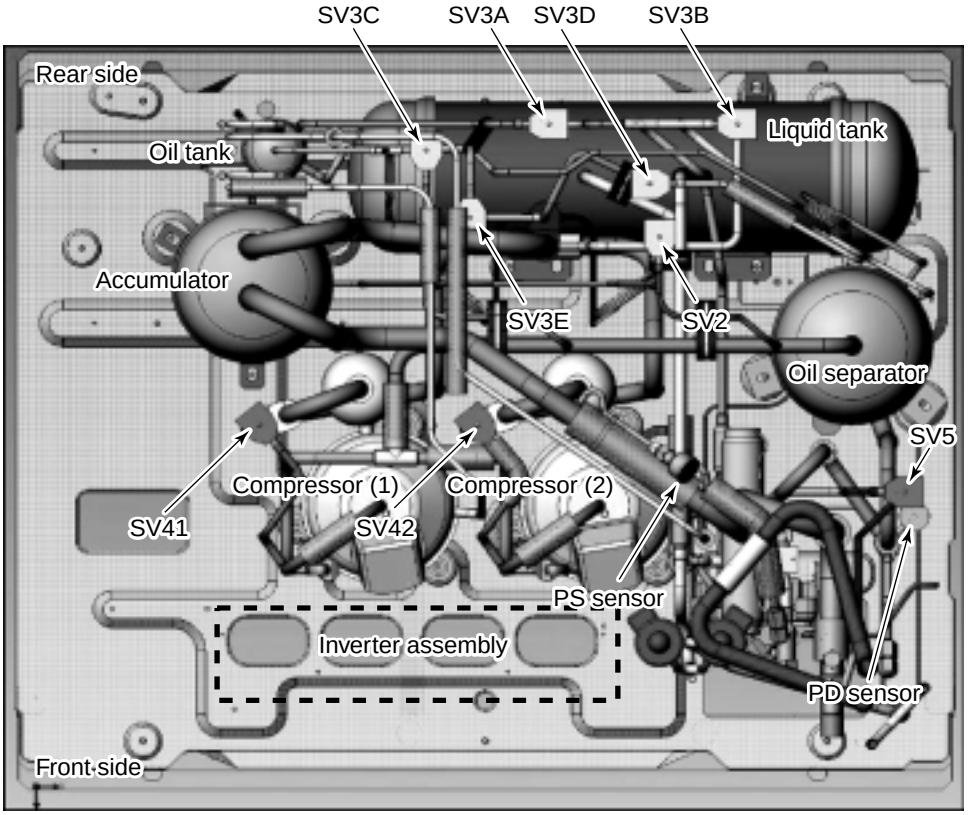
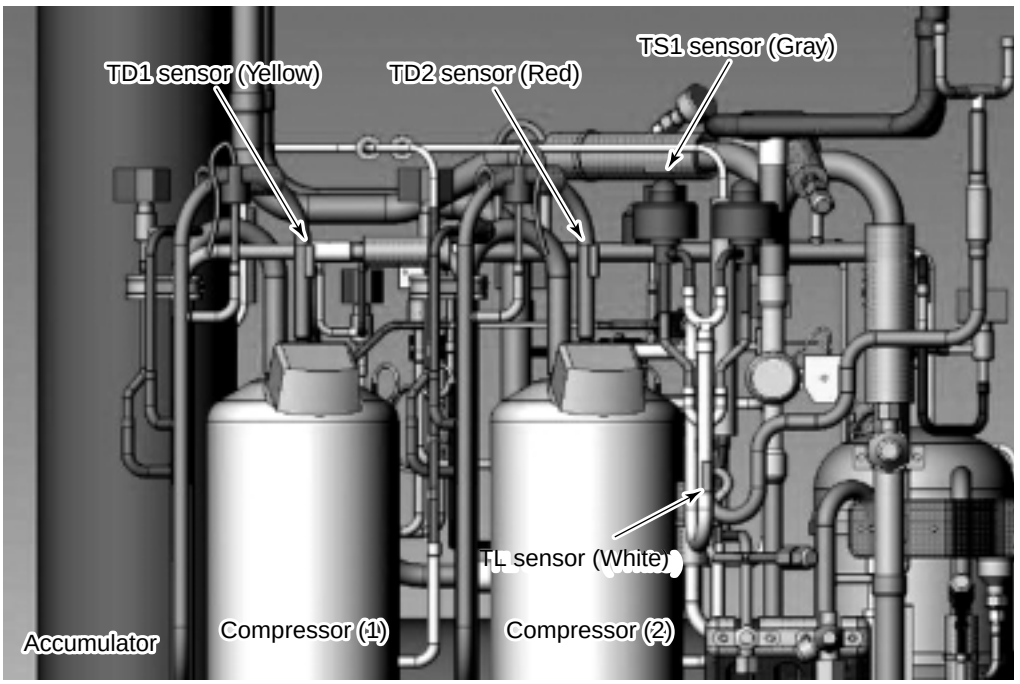
No.	Part to be exchanged	Work procedure	Remarks
2	Propeller fan motor	3) Take off flange nut fixing the fan motor and propeller fan. (To tighten the nut, turn it clockwise.) 4) Take off the square washer. 5) Take off the propeller fan. **NOTE)** Pull it straight upward. If it is pulled forcibly, it cannot be taken off. 6) Remove the connectors (2 positions) from IPDU P.C. board of the inverter fan, and then pull out the fan motor lead upward. 7) Take off the fixing screws (4 pcs.) of the fan motor.	
		◆ **Cautions when exchange/reassembling the fan motor** 1) Matching D-cut surface of the fan motor shaft with ▲ mark of the fan, insert the propeller fan. (If tightening D-cut surface as it is out of place, the propeller fan melts due to friction heat resulted in falling-off.) 2) Be sure to attach the square washer. (Abnormal sound or abnormal vibration may generate.) 3) Tighten the flange nut with 15N•m (153kg•cm). 4) Insert hooking claws of the discharge cabinet securely into the claw holes of the cabinet. (Refer to photo in the previous page; 3 positions each at front and rear sides, total 6 positions)	

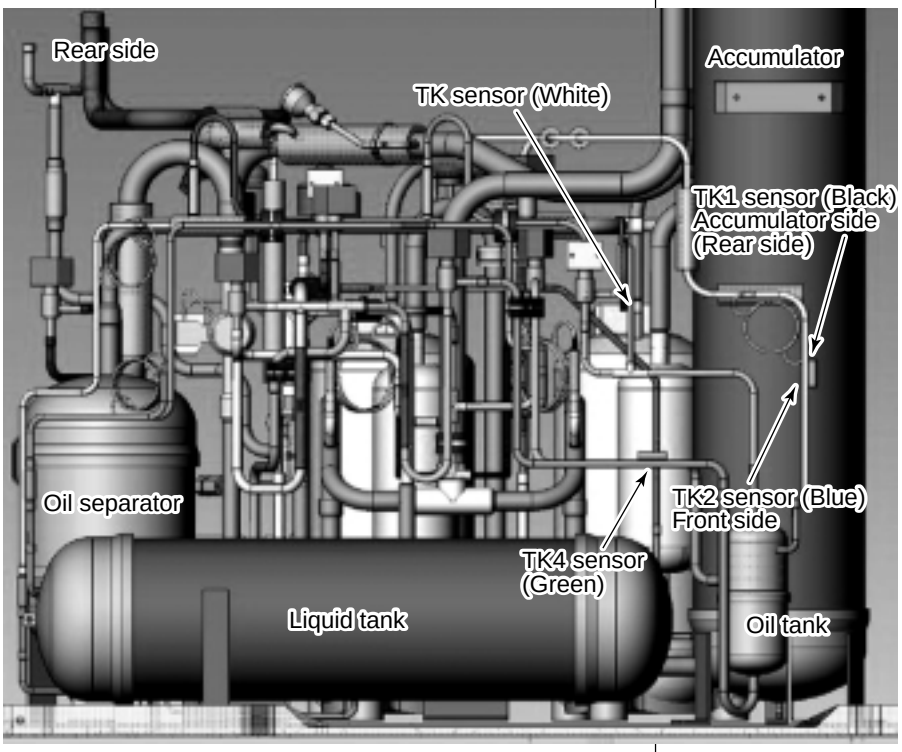
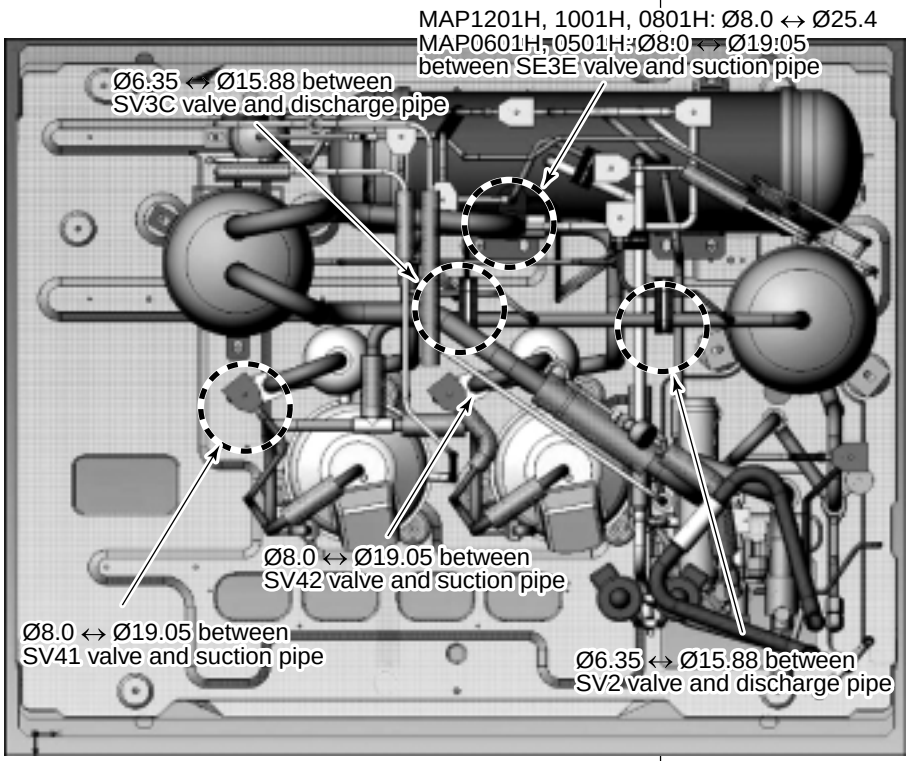
No.	Part to be exchanged	Work procedure	Remarks
3	Heat exchanger	**REQUIREMENT** Put on gloves during working; otherwise an injury may be caused by parts, etc. Before work, be sure to recover the refrigerant into a cylinder or the other linked unit so that there is no refrigerant in the outdoor unit. ◆ **Disassembling (Example): Heat exchanger (Right)** 1) Remove the cabinet. 2) Remove the motor base. (M5 × 10, 4 pcs.) 3) Remove the motor base bracket. (M5 × 10, 5 pcs.) 4) Take off screws of the heat exchanger fixing board. (M5 × 10, 6 pcs.) 5) Take off screws of the support. (M5 × 10, 3 pcs.´ 2) 6) Take off screws of waterproof board. (M4 × 10, 3 pcs.) 7) Remove brazing section of the connected pipe (4 positions). 8) Take off screws of the support at rear side, and then pull out the heat exchanger. (M5 × 10, 2 pcs.)	     Draw out it backward. (Draw out forward in case of left side of the heat exchanger.)

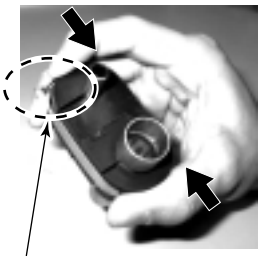
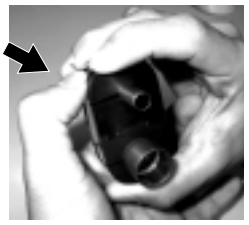
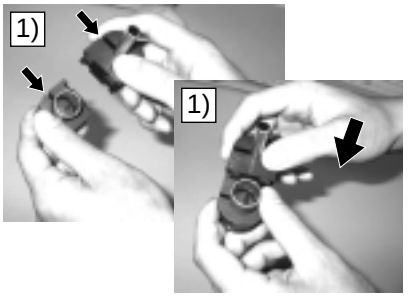
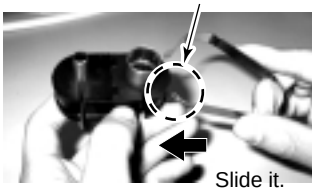
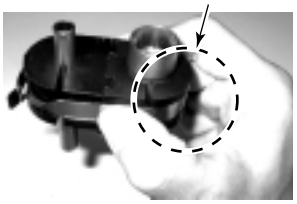
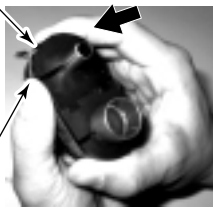
No.	Part to be exchanged	Work procedure	Remarks
4	HeInverter assembly ◆ Removal of box	**REQUIREMENT** Put on gloves during working; otherwise an injury may be caused by parts, etc. 1) Stop operation of the air conditioner, and then turn off switch of the breaker. 2) Take off the inverter cover. (M4 × 10, 2 pcs.) 3) Take off screws fixing the box. (1 pc. each at upper and lower sides.) 4) Push down lightly the fixing claw at lower side to take off the claw. (Lower part of the box is out forward.) 5) Take off hooking claw at upper side while holding the ceiling board with both hands.	  
		<Reassembly and cautions> 1) Hook the upper claw. 2) Push in the lower part. Be sure to check there is no pinching of cable at the corners of the rear side. 3) Tighten the fixing screws at upper and lower sides. (1 pc. each at upper/lower part)	 2) When pushing in the lower part, be sure to check there is no thinness of cable.

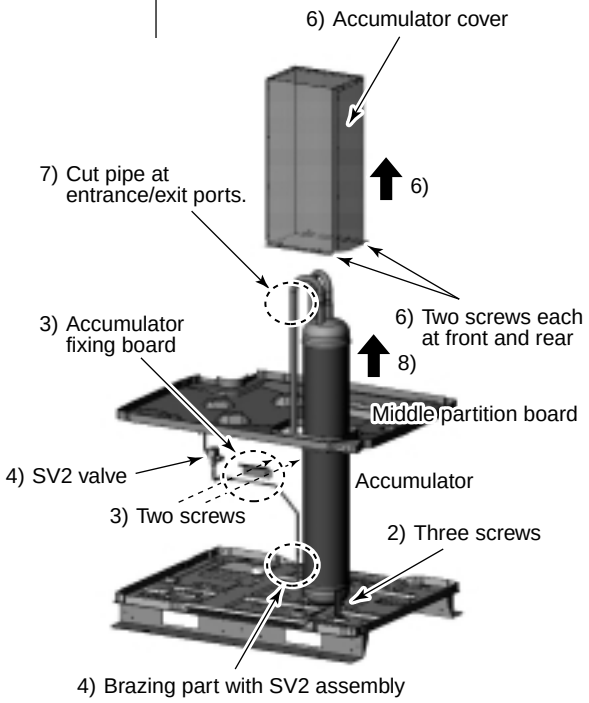
No.	Part to be exchanged	Work procedure	Remarks
5	Inverter assembly ◆ Removal of P.C. board and electric parts 1. Noise filter P.C. board 2. Interface P.C. board	**REQUIREMENT** Put on gloves during working; otherwise an injury may be caused by parts, etc. 1) Stop operation, and then turn off switch of the breaker. 2) Take off cables, and then remove the P.C. board from the card edge spacer at the corner. **<Exchange of service P.C. board>** For the interface P.C. board, it is necessary to set up jumper line, etc for each model. Refer to “Exchange procedure of interface P.C. board”.	
	3. IPDU P.C. board	1) Stop operation, and then turn off switch of the breaker. 2) Take off the heat sink (Radiator plate) fixing screws. ∗ (M4 × 16, 2 pcs.) 3) Take off cables. 4) Remove P.C. board from the card edge spacer at the corners. ∗ Heat sink fixing screw, compressor lead cables (U, V, W), etc, M4 screw tightening torque (1.47±0.1N•m) **<Exchange of service P.C. board>** For the IPDU P.C. board, it is necessary to set up jumper line, etc for each model. Refer to “Exchange procedure of IPDU P.C. board”.	
	4. IPDU P.C. board for fan	1) Stop operation, and then turn off switch of the breaker. 2) Take off cables. 3) Take off the heat sink (Radiator plate) fixing screws. ***** (M3 × 14, 4 pcs.) ∗ Tightening torque of screw for heat sink fixing board (0.55±0.1N•m)	

No.	Part to be exchanged	Work procedure	Remarks
5	Inverter assembly ◆ Removal of P.C. board and electric parts 5. Reactor 6. Transformer 7. Electrolytic condenser	**REQUIREMENT** Put on gloves during working; otherwise an injury may be caused by parts, etc. 1) Stop operation, and then turn off switch of the breaker. 2) Take off screws (3 positions) of the terminal block installation board. 3) Take off the fixing screws of each part, and then remove the cables. ∗ ∗ 7. Cautions when removing the electrolytic condenser 1) As the natural discharge by the electrolytic condenser may be unavailable and voltage may remain in some cases due to trouble conditions, be sure to perform discharge of the condenser. 2) Using resistance for discharge (100Ω/40W or equivalent) or (plug of) the soldering iron, make continuity and discharge between (+) and (–) poles. (This electrolytic condenser has a large capacity. Therefore it is dangerous to make discharge by shortening between (+) and (–) poles because big sparks generate.)	 Reactor, transformer, and electrolytic condenser are stored at the rear side of the terminal block.  

No.	Part to be exchanged	Work procedure	Remarks
6	Pressure sensor positions of 2-way valve coil		
7	Temperature sensor positions and identification	**<Front side of air conditioner>** 	

No.	Part to be exchanged	Work procedure	Remarks
7	Temperature sensor positions and identification	**<Rear side of air conditioner>**  	
8	Attachment/ detachment of pipe fixing rubber	In this air conditioner, (segmentation system) eyeglass rubber and SUS fix band are adopted for fixing the vibration system as one measures to improve the reliability. **<Used positions of SUS fixing band: Total 5 positions>**  	

No.	Part to be exchanged	Work procedure	Remarks
8	Attachment/ detachment of pipe fixing rubber	**REQUIREMENT** Put on gloves during working; otherwise an injury may be caused by parts, etc. **<Disassembling>** 1) Hold the both ends (longitudinal direction) of the rubber lightly, and then make a margin between SUS band and fixing rubber. 2) Pushing in the claw side of SUS band with fingers, the claw comes off from the square hole.	1)  Compress rubber and make margin. 2)  Push in the band toward arrow mark.
		<Assembly> 1) The fixing rubber is a segmentation system due to freedom degree of combination. Therefore, for assembly, it is recommended to fit both pipes including the fixing rubber after passing the rubber through the pipes separately. In this time, check both slit direct the same direction. 2) Align the claw side of SUS band to slit side of the rubber for assembly. (Assembly in reverse direction is also available, but the work performance decreases.) 3) Attach the band so that a clearance does not generate between SUS band and fixing rubber. Especially pay attention not to generate a clearance at part of the hair pin side of the band. 4) Fit the root of claw to the rubber lightly, push R part at square hole side toward the arrow mark, and then hook the claw to the square hole. (If it is not hooked, recheck 3) there is no clearance between band and rubber.)	Align direction of the slits, and then attach to each pipe.  Matching the claws, slide them. Align the claw to slit side of the rubber. 2)  Slide it. Push the band against rubber without clearance. 3)  Slide the square hole side toward arrow mark. 4)  Push claw side against the rubber.

No.	Part to be exchanged	Work procedure	Remarks
8	Exchange of accumulator	**REQUIREMENT** Put on gloves during working; otherwise an injury may be caused by parts, etc. Before work, be sure to recover the refrigerant into a cylinder or the other linked unit so that there is no refrigerant in the outdoor unit. 1) Remove the lower cabinet (rear side). 2) Take off fixing screws (M6 × 3 pcs.) for accumulator leg ⇔ base board. 3) Remove the accumulator fixing board ∗ ⇔ fixing screws of accumulator (M6 × 2 pcs.) ∗ The accumulator fixing board is fixed to the middle partition board. (Take off the screws only which fix to the accumulator unit.) 4) Remove the pipe (brazing part) connected to SV2 valve. 5) Remove the discharge cabinet, fan, and motor base. 6) Take off the accumulator cover ⇔ fixing screws (M5 × 4 pcs.) of the middle partition board, and then pull out it upward. 7) Using a pipe cutter, cut off entrance/exit pipe of accumulator at the specified position. (For the cut-off position, refer to the Manual attached to the repair parts.) 8) Pull out the accumulator upward.	

17. P.C. BOARD EXCHANGE PROCEDURES

17-1. Indoor Unit

17-1-1. Exchange of P.C. Board for Indoor Service

Part code	Model type	P.C. board model	Label display on P.C. board
431-6V-207	MMU-AP ** 1WH series MMU-AP ** 1H series MMU-AP ** 1YH series MMU-AP ** 1SH series MML-AP ** 1H series MML-AP ** 1BH series MMF-AP ** 1H series	MCC-1403	03RD M01
431-6V-210	MMU-AP ** 1BH series	MCC-1402	03DD M02
431-6V-225	MMU-AP ** 1H series MMC-AP ** 1H series MMK-AP ** 1H series	MCC-1402	03DD M03

Requirement at exchange of P.C. board assembly for indoor service

Before exchange, in the fixed memory (hereinafter EEPROM, IC10) installed on the indoor P.C. board, the type exclusive to the model and the capacity code are stored at shipment from the factory. The important setup data such as line/indoor/group address which are set up (Auto/Manual) or high ceiling exchange setup at installation time, respectively.

Proceed with exchange of P.C. board assembly for indoor service in the following procedure.

After exchange work, check again the setup for indoor unit No. or group header/follower units to confirm whether the setup contents are correct or not, and then check also the refrigerant circuit system by a test operation, etc.

<Exchange procedure>

Method 1

Before exchange, it is possible to turn on power of the indoor unit and read out the setup contents from the wired remote controller.

Readout of EEPROM data: **Procedure 1**

⇩

Exchange of P.C. board for service & power ON: **Procedure 2**

⇩

Writing-in of the readout EEPROM data: **Procedure 3**

⇩

Power supply reset (All the indoor units connected to the remote controller in case of group operation control)

Method 2

Before exchange, it is impossible to read out the setup contents due to EEPROM error.

Exchange of P.C. board for service & power ON: **Procedure 2**

⇩

Writing-in of the setup data such as the model name, capacity code, indoor unit address high ceiling setup, connection setup of option,
etc to EEPROM based upon customer's information: **Procedure 3**

⇩

Power supply reset (All the indoor units connected to the remote controller in case of group operation control)

Procedure 1 : Readout setup contents from EEPROM

(Contents of EEPROM with setup changed at local site include setup at shipment from the factory are read out.)

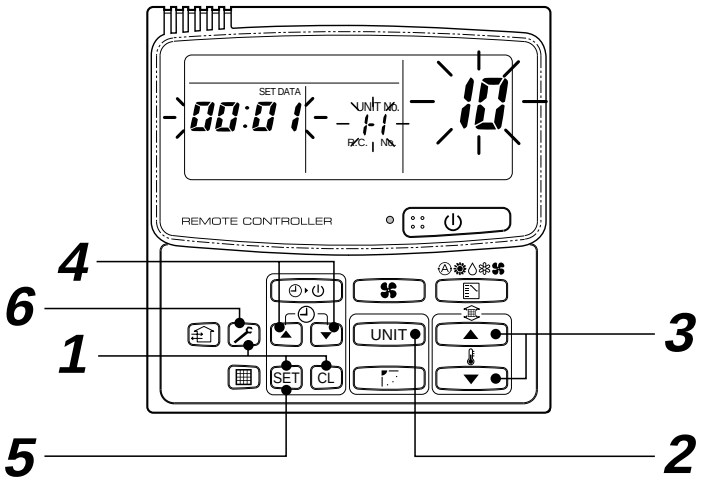
1. Push [SET] + [CL] + [🔧] buttons simultaneously for 4 seconds or more. ***1***
   * In a group operation control, the firstly displayed unit No. indicates the header indoor unit No.
   In this case, 10 is displayed in the item code (DN). The fan of the selected indoor unit operates, and also starts swinging in a model with flap.
2. Every pushing [UNIT] , the indoor unit Nos. in the group control are displayed successively. ***2***
   Specify the indoor unit No. to be exchanged.
   * The fan of the selected indoor unit operates, and also starts swinging in a model with flap.
3. Using temperature setup [▲] / [▼] buttons, the item code (DN) can be moved up/down one by one. ***3***
4. First change the item code (DN) from 10 → 01 . (Setup of filter sign lighting time)
   In this time, make a note of contents of the displayed setup data.
5. In the next time, change the item code (DN) using [▲] / [▼] buttons.
   Make a note of contents of the setup data as same as the above.
6. Then repeat item 5., and make a note of contents of the important setup data as indicated in the attached table (Example).
   * The item code (DN) is consisted with 01 to AA.
   DN No. may jump on the way.
7. When noting has finished, push [🔧] button to return to the normal stop status. ***6***
   (It requires approx. 1 minute to operate the remote controller.)

Item code necessary at minimum

DN	Contents
10	Type
11	Indoor unit capacity
12	Line address
13	Indoor address
14	Group address

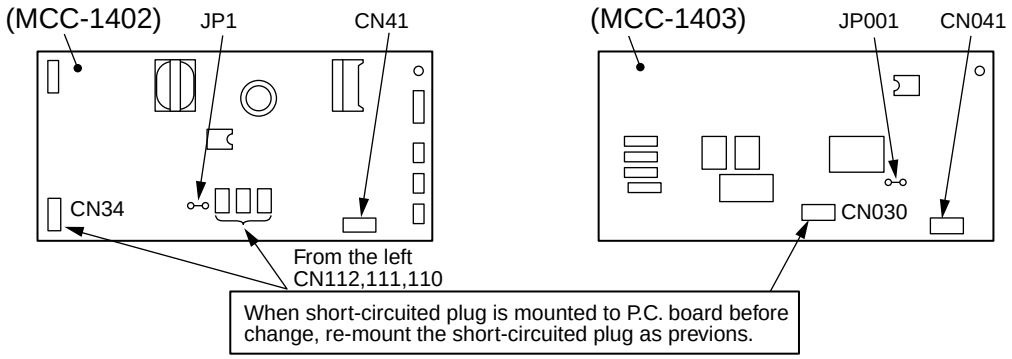
Type and capacity of the indoor unit are necessary to set up the revolution frequency of the fan.

<Remote controller operation diagram>



Procedure 2 : Exchange of P.C. board for service

1. Exchange P.C. board with a P.C. board for service.
   In this time, the jumper line (cut) setup or the (short-circuit) connecting connector setup on the previous P.C. board should be reflected on P.C. board for service. (See the blow figures.)



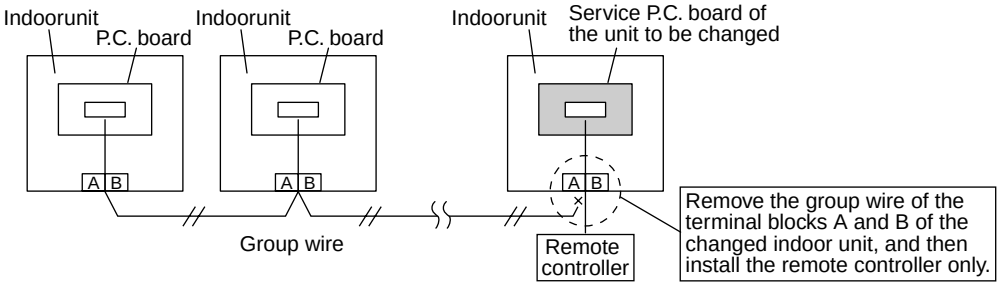
2. It is necessary to set Indoor unit to be exchanged : Remote controller = 1 : 1
   Based upon the system configuration, turn on power of the indoor unit with one of the following items.
   1) Single (Individual) operation
      Turn on power of the indoor units and proceed to **Procedure 3**.
   2) Group operation
      A) In case that power of the exchanged indoor unit only can be turned on
         Turn on power of the exchanged indoor unit only and proceed to **Procedure 3**.
      B) In case that power of the indoor units cannot be turned on individually (***Case 1***)
         a) Remove temporarily the group wire connected to the terminal blocks A and B of the exchanged indoor unit.
         b) After connecting the remote controller wire only to the removed terminal block, turn on power of the indoor units and proceed to **Procedure 3**.

      ∗ When the above methods cannot be used, follow to the two cases below.

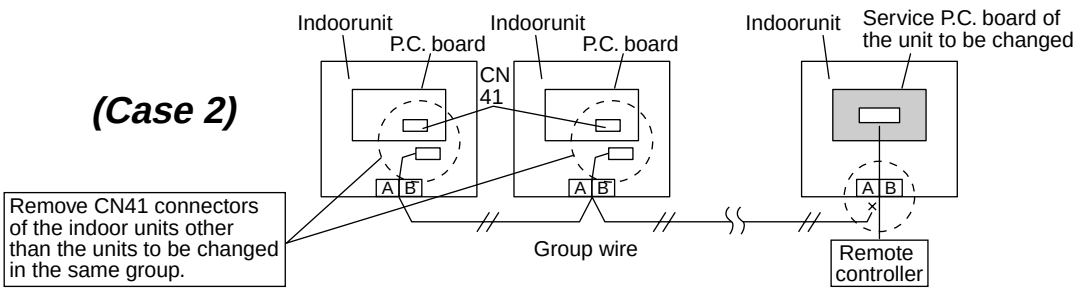
      C) In case that power of the indoor units cannot be turned on individually (***Case 2***)
         a) Remove all CN41 connectors of the indoor units in the same group except those of the exchanged indoor unit.
         b) Turn on power of the indoor units and proceed to **Procedure 3**.

      ∗ After **Procedure 3** operation has finished, be sure to return the temporarily removed group wire or CN41 connector to the original connection.

(Case 1)



(Case 2)



Procedure 3 : Writing-in of setup contents to EEPROM

(The EEPROM contents which are installed on the service P.C. board have been set up at shipment from the factory.)

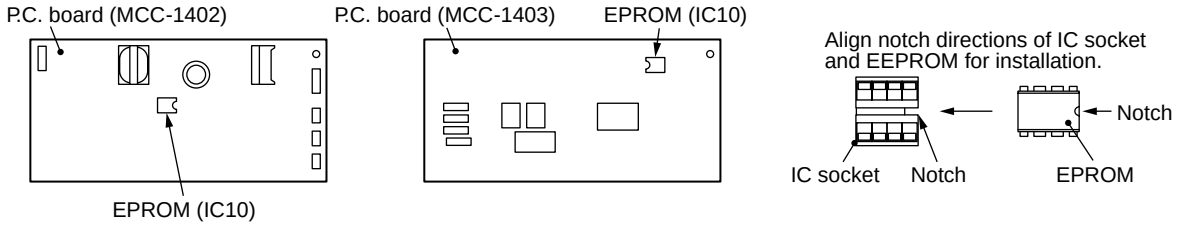
1. Push [SET] + [CL] + [🔧] buttons simultaneously for 4 seconds or more. **1**
   (ALL is displayed in the UNIT No box.)
   In this time, 10 is displayed in the item code (DN). The fan of the indoor unit operates, and also starts swinging in a model with flap.
2. Using temperature setup [▲] / [▼] buttons, the item code (DN) can be moved one step up 1 or down one by one. **3**
3. First set up the type and capacity code of the indoor unit.
   (The data at shipment from the factory is written in EEPROM by changing the type and capacity code.)
   1) Set 10 to the item code (DN). (As before)
   2) Using the timer time [▲] / [▼] buttons, set up the type. **4**
      (For example, 0001 indicates 4-way Air Discharge Cassette type.): Refer to the attached table.
   3) Push [SET] button. (OK if display goes on.) **5**
   4) Using temperature setup [▲] / [▼] buttons, set 11 to the item code (DN).
   5) Using the timer time [▲] / [▼] buttons, set up the capacity code.
      (For example, 0012 indicates 80 class.): Refer to the attached table.
   6) Push [SET] button. (OK if display goes on.)
   7) Push [🔧] button to return to the normal stop status.
4. In the next, the contents such as address setup, which were set up at the local site after installation are written in EEPROM. Execute again the operation in the above item 1).
5. Using temperature setup [▲] / [▼] buttons, set 01 to the item code (DN).
   (Lighting time setup for filter sign)
6. Compare the contents of the setup data which is displayed in this time with contents noted in a memo in **Procedure 1** and customer's information.
   1) If data is incorrect, change it using the timer time [▲] / [▼] buttons so that it matches with contents noted in a memo, and then push [SET] button. (OK if display goes on.)
   2) Do nothing if data is same as those in the memo.
7. Using temperature setup [▲] / [▼] buttons, change the item code (DN).
   Check also the contents of the setup data and then change them it to those in the memo.
8. Then repeat operations in items 6. and 7.
9. After setup operation, push [🔧] button to return to the normal stop status. **6**
   In a group operation, turn off the power supply once, return the group wires between indoor units and CN41 connectors as before, and then turn on power of all the indoor units.
   (It requires approx. 1 minute to operate the remote controller.)

   ∗ The item code (DN) is consisted with 01 to AA. DN No. may jump on the way.
   Even if pushing [SET] button after changing the data incorrectly, the data can be returned to one before change by pushing [CL] button before changing the item code (DN).

<EEPROM layout>

EEPROM (IC10) is attached to IC socket. To remove it, use a pair of tweezers, etc. To attach EEPROM, arrange the direction as shown in the following figures.

∗ In exchanging time, pay attention not to bend the lead wire of IC.



<Make a note of the setup contents. (Item code list (Example))>

DN	Item	Memo	Setup at shipment from factory
01	Filter sign lighting time		According to type
02	Dirty condition of filter		0000: Standard
03	Central control address		0099: Undefined
06	Heating inlet temp. shift		0002: +2°C (Floor standing: 0)
0d	Cooling Auto mode existence		0001: No auto mode cooling/heating (* Automatic selection by connected outdoor unit)
0F	Cooling only/Heat pump select		0000: Heat pump
10	Type		According to model type
11	Indoor unit capacity		According to capacity code
12	Line address		0099: Undefined
13	Indoor unit address		0099: Undefined
14	Group address		0099: Undefined
19	Flap type (Air direction adjustment)		According to type
1E	Temp. width between cooling and heating automatic selective control points		0003: 3 deg (Ts ± 1.5)
28	Automatic restart from power failure		0000: None
2A			
2E	HA terminal (T10) selection		0000: Normal
30			
31			
32	Sensor select		0000: Body sensor
40			
5d	High ceiling selection		0000: Standard
60	Timer setup (Wired remote controller)		0000: Possible

Type
Item code [10]

Setup data	Type	Model abb. name
0000	1-way Air Discharge Cassette	MMU-AP ∗∗∗ SH
0001∗	4-way Air Discharge Cassette	MMU-AP ∗∗∗ H
0002	2-way Air Discharge Cassette	MMU-AP ∗∗∗ WH
0003	1-way Air Discharge Cassette (Compact type)	MMU-AP ∗∗∗ YH
0004	Concealed Duct Standard	MMD-AP ∗∗∗ BH
0005	—	—
0006	Concealed Duct High Static Pressure	MMD-AP ∗∗∗ H
0007	Under Ceiling	MMC-AP ∗∗∗ H
0008	High Wall	MMK-AP ∗∗∗ H
0009		
0010	Floor Standing Cabinet	MML-AP ∗∗∗ H
0011	Floor Standing Concealed	MML-AP ∗∗∗ BH
0012	(Floor Standing 8, 10HP)	MMF-AP ∗∗∗ H
0013	Floor Standing (Below 6HP)	MMF-AP ∗∗∗ H

Indoor unit capacity
Item code [11]

Setup data	Model	Setup data	Model
0000∗	Invalid	0016	—
0001	0071 type	0017	0481 type
0002	—	0018	0561 type
0003	0091 type	0019	—
0004	—	0020	—
0005	0121 type	0021	0721 type
0006	—	0022	—
0007	0151 type	0023	0961 type
0008	—	0024	—
0009	0181 type	0025	—
0010	—	0026	—
0011	0241 type	0027	—
0012	—	0028	—
0013	—	~	—
0014	0271 type	0034	—
0015	0301 type		

∗ The initial setup value of EEPROM installed on the service P.C. board

17-2. Outdoor Unit

17-2-1. Cautions in Service for Compressor

1. When checking the inverter output, remove the both wires of the compressor as follows.

17-2-2. How to Check Inverter Output

1. Turn off the power supply.
2. Remove the compressor lead from the compressor. (Be sure to remove lead wires of both compressors.)
3. Turn on the power supply and drive the air conditioner in cool or heat mode. In this case, be careful so that a fasten terminal of the compressor lead does not come to contact with other fasten terminal or you don't touch other parts (Set cabinet).
4. Check the output voltage of the compressor lead at the inverter side.
   If the result is not accepted by the following criteria, replace IPDU P.C. board.

No.	Measuring position	Criteria
1	Between Red and White	360V to 520V
2	Between White and Black	360V to 520V
3	Between Black and Red	360V to 520V

∗ After check of output, sufficiently check there is no distortion on the fasten terminals when reconnecting the compressor lead to the compressor terminals. If any distortion is found, caulk the fasten terminal with pliers, etc. and then connect it.

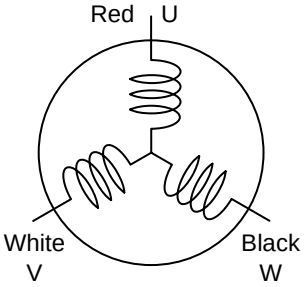
<How to check resistance or compressor winding>

1. Turn off the power supply.
2. Remove the compressor lead from the compressor.
3. Using a tester, check the winding resistance between each phases of each compressor and resistance of the outdoor cabinet.
   - Is not grounded?
     → It is normal if there are 10MΩ or more.
   - Is not short-circuited between windings?
     → It is normal if there are 0.1Ω to 0.3Ω. (Use a precise digital tester.)

17-2-3. How to Check Outdoor Fan Motor

1. Turn off the power supply.
2. Remove three fasten terminals (U, V, W) of the fan motor from IPDU P.C. board for the outdoor fan.
3. Turn the fan with hands. If it is not turned, a fan motor error (Lock) is considered. Replace the fan motor with a new one. When it is turned, measure the winding resistance between each phases of the fasten terminal (motor winding) with a tester. It is normal if the winding resistance between phases are 13 to 33Ω.
   (Use a precise digital tester.)

Part name	Procedure
Outdoor fan motor	Measure resistance of each winding with a tester.



Position	Resistance
Red-White	13~33Ω
Black-Red	13~33Ω
White-Black	13~33Ω

(Normal temp.)

17-2-4. How to Check Fan Power Supply P.C. Board and Fan IPDU

The fan power supply P.C. board supplies DC power. It supplies DC280V for the fan IPDU, and DC12V and DC7V for the control power supply respectively. If the control power is not supplied, a communication error (Error code [E31]) is out.

1. How to check fan power supply P.C. board (MCC-1439)

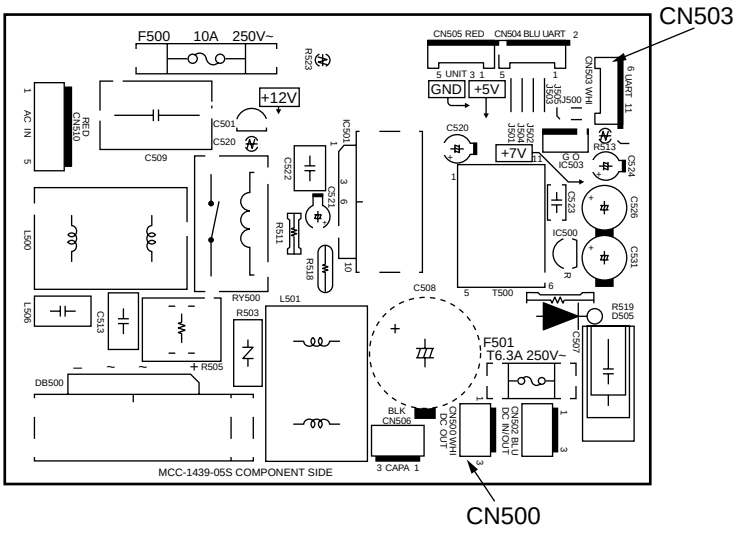
As shown in the following table, measure the voltage of the check positions with a digital tester.

No.	Check item	Check position	Criteria
1	DC280V output	Between CN500 ① and ③	DC260 to DC340V
2	Control power voltage	Between CN500 ① and ⑤	DC12V
3		Between CN500 ② and ⑤	DC7V

2. How to check fan IPDU

1. Check that the lead wires are correctly inserted into 250 fasten terminal of DC280V input and into the communication connector (CN01).
2. After then replace the fan IPDU if an abnormality is recognized.

<MCC-1439 Front View>



17-2-5. Interface Board Replacement Procedure Manual

This service board is commonly installed in different models before shipment. If the board assembly is to be replaced, check the displayed inspection contents and replace the board properly in accordance with the model, following this procedure manual.

<Replacement steps>

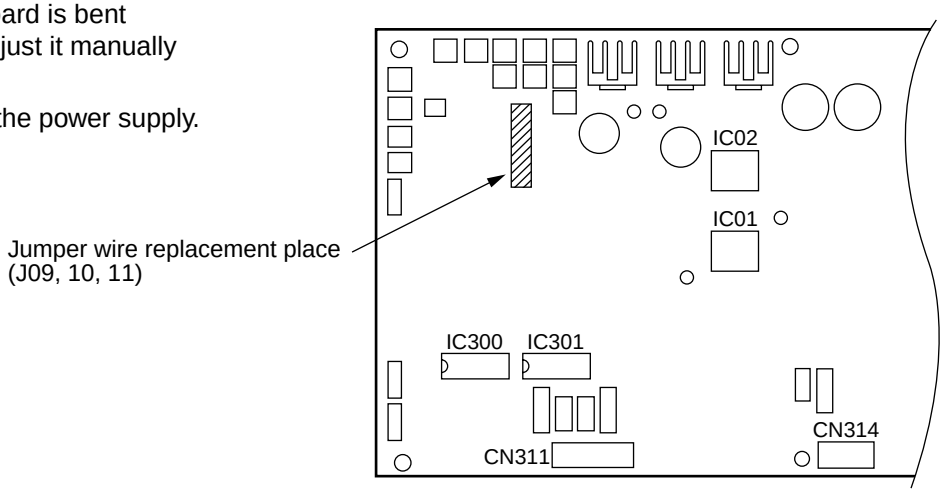
1. Turn off the power supply of the outdoor control unit (Turn off the power supply of the outdoor unit).
2. Remove all of the connector and fasten and screw terminals connected to the interface board (Remove the connector and fasten terminals by holding them).
3. Remove the interface board from the six card edge spacers.
4. Disconnect the jumper wires of the service board, as instructed in the table below.
   The jumper setting differs from the one before replacement.
   If the model is not specified, inspection code “L10” is displayed and the equipment will not operate.

No.	Model name	J09	J10	J11
At shipment	Service P.C. board	Yes	Yes	Yes
1	MMY-MAP0501H8-INV	Disconnect	Leave intact	Disconnect
	MMY-MAP0501H7-INV			
2	MMY-MAP0601H8-INV	Leave intact	Leave intact	Disconnect
	MMY-MAP0601H7-INV			
3	MMY-MAP0801H8-INV	Disconnect	Disconnect	Leave intact
	MMY-MAP0801H7-INV			
4	MMY-MAP1001H8-INV	Leave intact	Disconnect	Leave intact
	MMY-MAP1001H7-INV			
5	MMY-MAP1201H8-INV	Disconnect	Leave intact	Leave intact
	MMY-MAP1201H7-INV			

5. Set dip switch settings of the service board to the switch settings before replacement.

Dip Switch	Setting contents
SW07	Demand setting
SW10	Outdoor fan high static pressure setting, etc.
SW11	Cooling/Heating priority setting, etc.
SW13	System address setting
SW14	
SW30	Terminating resistance setting

6. After setting the jumper wires of the service board, install the service board in the outdoor control unit (Confirm that it is securely fixed to the card edge spacers.)
7. Connect the connector and fasten terminals (Confirm that they are correctly and securely inserted).
8. If a component part on the board is bent during board replacement, adjust it manually not to contact other parts.
9. Install the cover then turn on the power supply. Check the operation.



17-2-6. Comp-IPDU Board Replacement Procedure Manual

This service board is commonly installed in different models before shipment. If the board assembly is to be replaced, replace it properly in accordance with the model, following this procedure manual.

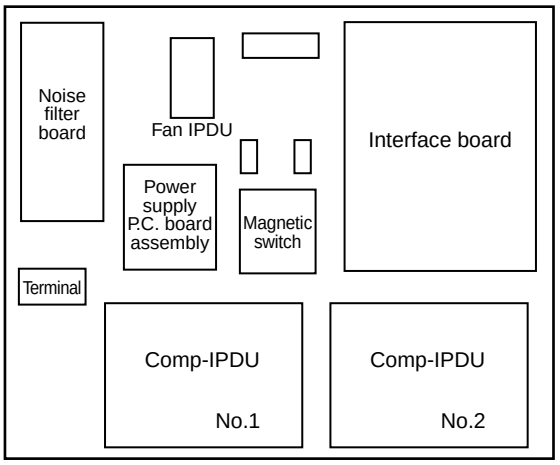
<Replacement steps>

1. Turn off the power supply of the outdoor control unit (Turn off the power supply of the outdoor unit).
2. Confirm that the charged voltage of the condenser has been fully discharged. (Confirm that the voltage between CN13 and CN15 is 0V).
3. Remove all of the connector and fasten and screw terminals connected to the A3-IPDU board (Remove the connector and fasten terminals by holding them.)
4. Remove 2 screws that fix the IGBT (Q200) of the Comp-IPDU board to the heat sink.
5. Remove the Comp-IPDU board from the four card edge spacers.
6. Set the dip Switch (SW801) of the Comp-IPDU board, as instructed in the table below.
   If the model is not specified, inspection “L29” is displayed and the equipment will not operate.

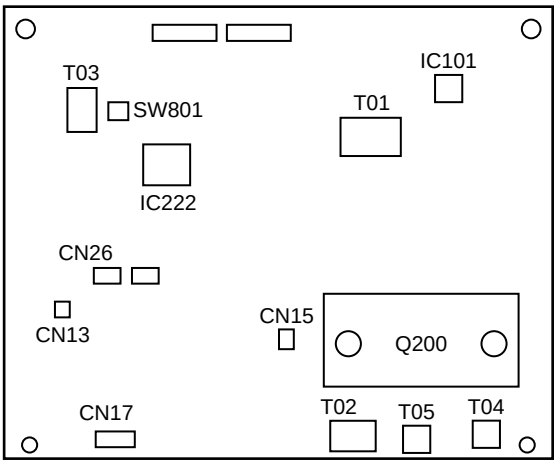
Comp-IPDU No.	SW801	
	Bit 1	Bit 2
JAt shipment	ON	ON
No.1	ON	ON
No.2	ON	OFF

7. After setting the dip Switch of the service board, apply silicone grease evenly onto the IGBT and install it in the outdoor control unit (Confirm that it is securely fixed to the card edge spacers).
8. Fix the IGBT of the Comp-IPDU board to the heat sink with two screws.
9. serted).
10. If a component part on the board is bent during board replacement, adjust it manually not to contact other parts.
11. Install the cover then turn on the power supply. Check the operation.

Board layout the inverte



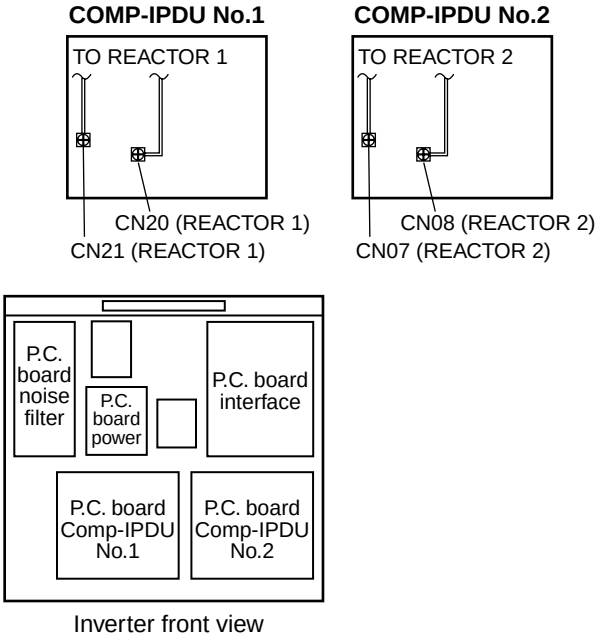
Switch layout on the board



17-2-7. Notice for Wiring

Wiring for service shall be done according to the wiring diagram.

Special caution is needed for reactor, which has different connecting points on COMP-IPDU1 and COMP-IPDU2.



Inverter front view

DANGER

The electrolytic capacitors in this panel are charged to 660 volts D.C.

Before servicing, turn off the power supply and allow the capacitor to discharge for at least 10 minutes. (Purpose: Discharge the capacitor)

Discharge to a safe level 10 volts D.C. or LESS. Test with a D.C. Voltmeter as shown.

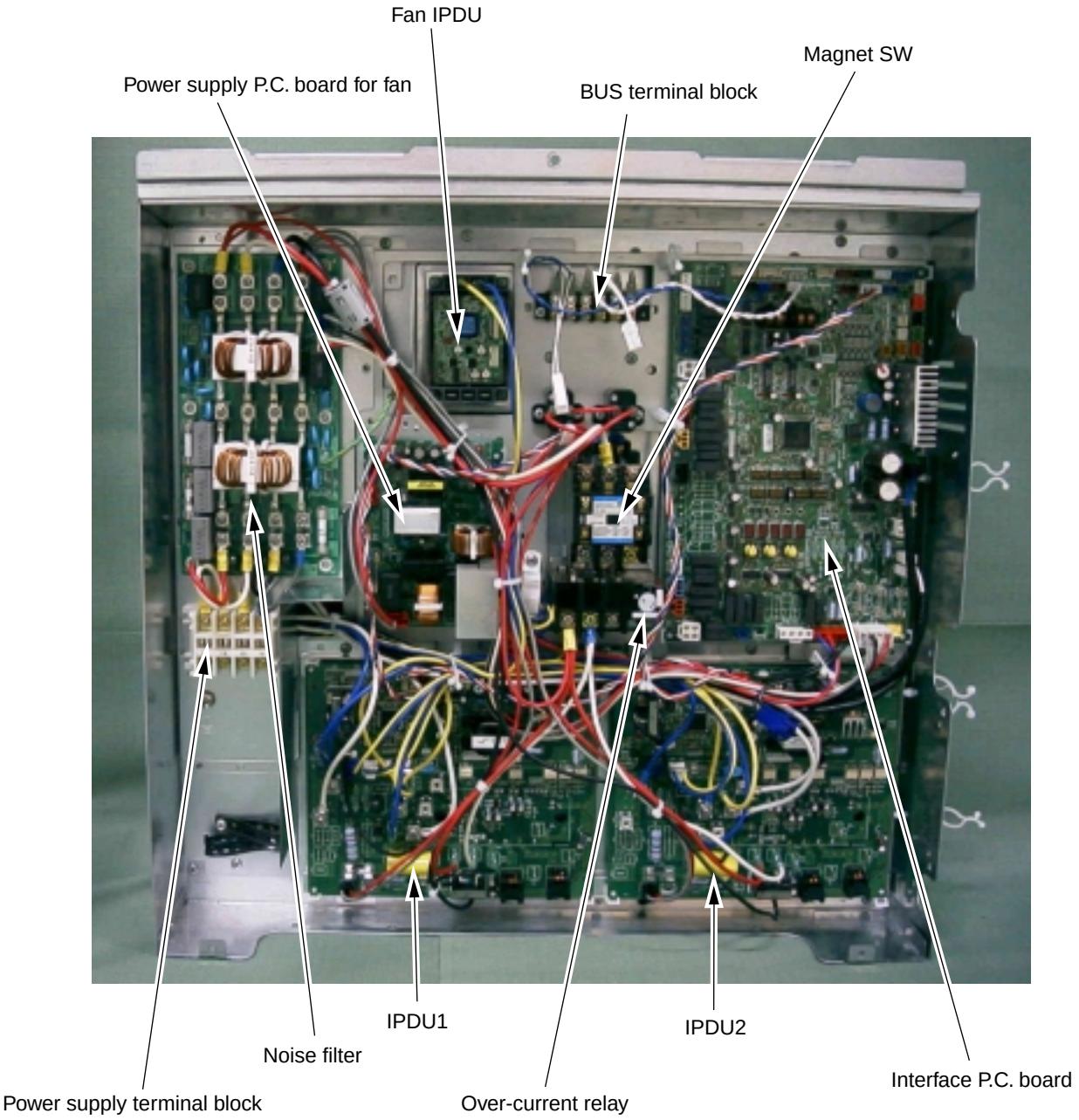


COMP-IPDU No. 1 and COMP-IPDU No.2 have the same electric potential, but both voltages shall be measured.

Never discharge the capacitor terminals with any metal implement.

Personal injury or equipment damage may result.

<Inverter Assembly Configuration>



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